JAN 27 1927

VOL. X DECEMBER, 1926 No. 4

The Journal of APPLIED PSYCHOLOGY

EDITORS

JAMES P. PORTER
Ohio University

WILLIAM F. BOOK
Indiana University

WITH A

BOARD OF CO-OPERATING EDITORS

TABLE OF CONTENTS

H. E. GARRETT AND T. R. FISHER. The Prevalence of Certain Popular Misconceptions 411

GEORGE D. STODDARD AND G. M. RUCH. Ratings of Downey Will-Temperament Traits 421

EDWARD S. JONES. The Opinions of College Students 427

THOMAS R. GARTH. Mental Fatigue of Indians of Nomadic and Sedentary Tribes 437

MARY GOODYEAR EARLE. The Relation Between Personality and Character Traits and Intelligence 453

HARVEY C. LEHMAN AND PAUL A. WITTY. The Negro Child's Index of More Social Participation 462

MAUD A. MERRILL. Mental Differences in Children Referred to a Psychological Clinic 470

RICHARD S. UHRBROCK. Interest as an Indication of Ability 487

ROY M. DORCUS. Some Factors Involved in Judging Personal Characteristics 502

JUNE E. DOWNEY. A Case of Special Ability with Below Average Intelligence 519

NOTES AND NEWS 522

BOOK REVIEWS 526

NEW BOOKS AND PAMPHLETS RECEIVED 536

INDEX 539

PUBLISHED BY THE EDITORS
THE WILLIAMS & WILKINS CO.
Mount Royal and Guilford Avenues
Baltimore, Md.

Entered as second class matter June 3, 1924, at the post office at Baltimore, Maryland, under the act of March 3, 1879.

Acceptance for mailing at special rate of postage provided for in section 1103, act of October 3, 1917 authorized December 21, 1922.

COPYRIGHT 1927, BY JAMES P. PORTER

The Journal of Applied Psychology

CO-OPERATING EDITORS

W. V. Bingham, Carnegie Institute of Technology; June E. Downey, University of Wyoming; Robert H. Gault, Northwestern University; William Healy, Baker Foundation, Juvenile Court, Boston; H. L. Hollingworth, Columbia University; Joseph Jastrow, University of Wisconsin; Herbert S. Langfeld, Princeton University; James H. Leuba, Bryn Mawr College, Henry C. McComas, Princeton University; Walter D. Scott, Northwestern University; C. E. Seashore, University of Iowa; Daniel Starch, Harvard Graduate School of Business Administration; Edward K. Strong, Jr., Leland Stanford Jr. University; L. M. Terman, Leland Stanford Jr. University; E. L. Thorndike, Columbia University; J. E. Wallace Wallin, Teachers College Miami University; G. M. Whipple, University of Michigan; Helen Thompson Woolley, Merrill-Palmer School, Detroit.

The scope of The Journal of Applied Psychology will include the following: (a) The application of psychology to vocational activities, such as law, art, public speaking, industrial and commercial work, and problems of business appeal. (b) Studies of individual mentalities, such as types of character, special talents, genius, and individual differences, including the problems of mental diagnosis and vocational prognosis. (c) The influence of general environment conditions, such as climate, weather, humidity, temperature; also such conditions as nutrition, fatigue, etc. (d) The psychology of everyday activities, such as reading, writing, speaking, singing, playing games or musical instruments, sports, etc.

Communications, manuscripts, reviews, summaries, notices, books and off-prints for review should be addressed to Dr. James P. Porter, Ohio University, Athens, Ohio. Contributors are requested to follow the conventional method of citation employed by this Journal; in every case the year, volume and pages should be specified.

The Journal of Applied Psychology is published quarterly. The subscription price is $5.00 a year. Single numbers $1.50. Remittances and business communications should be addressed to the Editors, James P. Porter, Ohio University, Athens, Ohio, or to William F. Book, Indiana University, Bloomington, Indiana.

THE PREVALENCE OF CERTAIN POPULAR MISCONCEPTIONS

H. E. GARRETT AND T. R. FISHER

Columbia University

The existence of a very large body of popular misconceptions and their general acceptance even by those who by modern standards would be considered educated, is a matter of considerable interest to the psychologist. Several investigators have been interested in the problem. Peters (1) and Dresslar (2) have examined the prevalence and probable sources of certain of these beliefs, while Conklin (3) and Nixon (4) have investigated their incidence among college students.

Conklin found that more women than men admitted belief in current superstitions: the superstitious beliefs of the women centering around the home, love, marriage and death, while those of the men were more largely concerned with "luck" in sports, business, etc. Nixon used a questionnaire consisting of thirty statements, none of which has any real scientific basis in fact,—though many are widely accepted by the hypothetical man-in-the-street. These questionnaires were given to 140 women and 219 men, all students in elementary psychology classes in the extension divisions of Columbia University and New York University. Nixon's results showed that on the whole the women were more credulous than the men, the difference between the average number of statements marked "True," i.e., believed, showing a small—but reliable—balance in favor of the men. The order of prevalence for the 30 beliefs, as determined by the per cent marking each as True, was almost identical for men and women, the coefficient of correlation by the rank-method being 0.90.

No measure of general intelligence was secured by Nixon for either of his groups. For this reason it seemed to the

writers worth while to repeat his questionnaire with a group for whom intelligence measures could be secured. At the same time, we decided that it would be of interest to take younger subjects than those examined by Nixon in order to compare the attitudes of the older and younger groups. Both of Nixon's groups were somewhat more mature—as well as more heterogeneous—than the usual college population, and accordingly they are probably more representative of the educational and cultural level of average (and somewhat above average) adults than a corresponding sampling of college men and women.

A Questionnaire

Directions: Below are a number of statements. Some of them you may consider true, some false. If you think a statement is substantially true, draw a circle around the T; if you think the statement false, draw a circle around the F. Where it seems debatable, mark as seems to you nearest correct.

1. T F The number of man's senses are five.
2. T F A child comes into the world with an instinctive knowledge of good and evil.
3. T F Certain lines in a person's hand fortell his future.
4. T F If you stare at a person's back you can make him turn around. This is a form of telepathy.
5. T F It is unlucky to have anything to do with the number 13.
6. T F A man's character can be read by noting the size and location of certain special developments on his head.
7. T F People with greenish eyes are not as trustworthy as people with blue or black eyes.
8. T F An expectant mother by fixing her mind on a subject can influence the character of her unborn child.
9. T F Women are inferior to men in intelligence.
10. T F People born under the influence of certain stars show this influence on their characters.
11. T F Intelligence can be increased by proper training.
12. T F Long slender hands indicate an artistic nature.
13. T F Beginning an undertaking on Friday is almost sure to bring bad luck.
14. T F If a man had faith enough he could heal a broken limb.
15. T F Many eminent men have been feeble-minded in childhood.
16. T F Some animals are as intelligent as the average man.

17. T F No defect of body or mind can hold us back if we have will-power enough.
18. T F Adults sometimes become feeble-minded from over-study.
19. T F All men are created equal in capacity for achievement.
20. T F The marriage of cousins is certain to result in children of inferior intelligence.
21. T F Especially intelligent children are apt to be weak and retarded physically.
22. T F The study of mathematics is valuable because it gives one a logical mind.
23. T F You can estimate an individual's intelligence pretty closely by looking at his face.
24. T F A square jaw is a sign of will-power.
25. T F A high forehead indicates superior intelligence.
26. T F A person who does not look you in the eye is likely to be dishonest.
27. T F Women are by nature purer and nobler than men.
28. T F Man is superior to the animals because his conduct is guided by reason.
29. T F Any physical or mental disease can be contracted by thinking too much about it.
30. T F Blondes are less trustworthy than brunettes.
31. T F Cold hands are the sign of a warm heart.
32. T F A person who holds his thumbs in his hands is a coward.
33. T F If your ears burn it is a sign that someone is talking about you.
34. T F Conscience is an infallible guide to conduct.
35. T F Silent men are generally deep thinkers.
36. T F Fat people are always good natured.
37. T F Women possess a power of intuition absent in men.
38. T F Chess and checker playing develop one's power of concentration.
39. T F The slow learner retains better what he gets than the quick learner.
40. T F Brains and beauty rarely go together.

First we increased Nixon's questionnaire from 30 to 40 statements by the addition of material of a like nature to that already included. This lengthened questionnaire, see this and the preceding page, was then given to 140 senior girls in the Washington Irving High School in New York City, and to 115 senior boys in the De Witt Clinton High School in the same city. The median age of both boys and girls was nearly

TABLE 1

Number of statements in the questionnaire marked true

NUMBER OF STATEMENTS MARKED AS TRUE	NUMBER OF SENIORS MARKING STATEMENTS AS TRUE	
	Boys	Girls
0	0	0
1	0	0
2	0	0
3	0	0
4	0	0
5	1	0
6	0	0
7	0	0
8	0	0
9	2	0
10	2	1
11	2	1
12	12	3
13	6	2
14	6	4
15	5	7
16	7	4
17	11	7
18	9	11
19	2	10
20	8	6
21	4	10
22	7	6
23	1	6
24	3	8
25	5	5
26	3	1
27	1	4
28	1	1
29	0	1
30	1	0
31	1	2
Total	100	100
Average	17.6	19.9
S.D.	4.72	4.46
$S.D_{Av.}$	0.47	0.45

Difference Av. 1–Av. 2	2.3
$S.D_{diff.}$	0.65
$\frac{D.}{S.D._{diff.}}$	3.5

17 years. No formal directions were given; the subjects were simply told to circle the T before all statements which they considered true, and to circle the F before all statements which they considered false. To encourage rapid reading with a view to securing the first impression, a time limit of 10 minutes was set. This time limit served also to prevent comparisons of one paper with another.

Intelligence records could not be secured for all of the boys and girls tested. Accordingly, we decided to select just 100 individuals of both sexes for whom the records were complete, and to base our study on these two equal groups. Table 1 shows how many of the 40 statements were believed to be true by the members of each group. It will be noticed that with the exception of three boys all of both groups believed at least ten of the statements to be true, while one boy and two girls believed as many as 31 of the statements. The average number of statements marked true was 17.6 for the boys and 19.9 for the girls, a difference of 2.3. This difference—while small—is found to be reliable from the D/SD_D. The two groups vary to about the same degree around their respective means.

It is interesting to compare these results with those of Nixon. He found that the average number of statements believed to be true was 10.5 for his group of 219 men and 12.3 for his group of 140 women. Four men and one woman believed none of the statements, and with the exception of one man and one woman, no one admitted believing more than 20. Allowing for the fact that there were 10 more statements in our questionnaire, it is still evident that our boys and girls are considerably more credulous than Nixon's men and women. This result is certainly at variance with the popular opinion as to the sophistication and "show me" attitude of the younger generation. Nixon suggests that a low "superstition score," i.e., few statements marked true, may "mean greater familiarity with scientific knowledge, and it may merely mean greater caution." For children, few superstitions or misconceptions probably mean educated parents and a cultured environment.

TABLE 2

Orders of belief for 40 statements

STATEMENT NUMBER	IDEA INVOLVED	PER CENT OF SENIORS MARKING TRUE		ORDER OF BELIEF PREFERENCE	
		Boys	Girls	Boys	Girls
38	Power of concentration developed by chess and checker playing	93	96	1	1.5
11	Intelligence increased by training	92	92	2.5	4
22	Mathematics gives a logical mind	92	93	2.5	3
28	Man superior to animals in reason	88	91	4	5
34	Conscience an infallible guide	82	96	5	1.5
1	Man's senses are five	69	80	6	7
17	Will power supreme	66	76	7.5	8
35	Silent men deep thinkers	66	87	7.5	6
18	Overstudy causes feeble-mindedness	65	56	9	19
37	Women possess intuition	58	64	10	13
6	Character indicated by head shape	55	66	11.5	11.5
12	Artistic nature indicated by hands	55	61	11.5	15
4	Telepathic influence in staring	35	60	13	16
23	Face shows intelligence	51	72	14	9
27	Women purer than men by nature	50	63	15.5	14
26	A shifty eye indicates dishonesty	50	69	15.5	10
8	Prenatal influence	48	43	17	24
25	High forehead shows intelligence	47	50	18	22
24	Square jaw indicates will power	46	58	19	18
39	Slow learner a good retainer	45	59	20	17
16	Some animals intelligent as human	43	66	21.5	11.5
21	Bright children physically retarded	43	29	21.5	31
40	Brains and beauty not together	37	53	23	20
36	Fat people good natured	36	19	24.5	33
29	Thinking may cause disease	36	36	24.5	27
14	Faith can heal a broken limb	34	23	26.5	32
2	Instinctive knowledge of good	34	38	26.5	26
19	Men created equal in capacity	32	49	28.5	23
20	Marriage of cousins gives defectives	32	32	28.5	28.5
3	Lines in hand fore-tell future	24	51	30	21
10	Influence of stars on character	21	40	31	25
9	Women inferior to men in intelligence	20	7	32	36
31	Cold hands mean a warm heart	18	15	33	34
15	Early feeble-mindedness of great men	17	31	34	30
33	Burning ears someone talking	15	9	35	35
30	Blondes less trustworthy	13	3	36	38.5
32	Coward holds thumbs in fists	8	32	37	28.5
5	Thirteen unlucky	5	3	38	38.5
7	Green-eyed people untrustworthy	4	2	39	40
13	Friday unlucky	3	6	40	37

Another comparison of our boys and girls can be made by determining the percentage of each group which marked each statement true. These per cents have been tabulated in table 2, and enable us to arrange the statements in an order of merit for belief. It is interesting to note that 93 per cent of the boys and 96 per cent of the girls believe that chess and checker playing develop one's powers of concentration, while an equal percentage of the girls believe that conscience is an infallible guide to conduct. Both groups are agreed that mathematics gives one a logical mind, and that intelligence can be increased by training. The three statements about which the boys are most skeptical are that Friday is unlucky, that thirteen is an unlucky number, and that green-eyed persons are untrustworthy. The girls agree with respect to the last two statements, but are not so skeptical about the bad influence of Friday. Only 3 per cent of the girls, however, believe that blondes are less trustworthy than brunettes (probably personal considerations entered in here!) while 13 per cent of the boys marked this statement true. Despite certain interesting variations, the orders of merit for belief in the 40 statements correspond closely for the sexes: the rank-order coefficient of correlation is 0.92.

The statements shown in table 2 seem to fall roughly into three groups. In the first group are those misconceptions most widely held, i.e., by from 95 to 50 per cent of both groups. The reason for belief in these statements is probably simply lack of scientific information, or as Nixon suggests, ignorance of the specific meaning given by the scientist to such terms as intelligence, will, feeble-mindedness, intuition, etc. The second group includes those statements marked true by from 50 to 25 per cent of the two groups. These deal largely with the pseudo-sciences of astrology and palmistry, as well as the widely popular ideas that character can be "read" from the face, or by certain bodily signs. Some come, too, from religion and from newspaper psychology regarding instincts, learning, and the effects of heredity. Such misconceptions as these are widely exploited by lecturers on so-called "applied psychology"

and by advertisements of individuals who claim to teach concentration, character reading, or will-power development in five (or less) lessons. Certain magazines also do their part to keep them alive, and many religious and semi-religious organizations have not yet outgrown them. In the third group are those statements marked true by roughly 25 per cent and less of our subjects. These misconceptions are for the most part superstitions of the most primitive sort, and are held by only the most credulous. It is rather significant that the orders of belief for our groups of boys and girls is almost identical with the order found by Nixon for his group of 359 men and women. In nearly every case, however, a larger per cent of the boys and girls mark the statements true than of the men and women.

TABLE 3

	r(BOYS)	r(GIRLS)
Between I.Q. and Misconception Score	−0.02	−0.11
Between I.Q. and Misconceptions, chronological age constant	0.00	0.01

Since we had the I.Q.'s for all of the members of our two groups, correlations could be computed between intelligence and misconception scores, i.e., statements marked true. These are given in table 3. Note that the correlation between intelligence and misconceptions is entirely negligible both for the boys and girls whether we consider the entire r's, or the r's with chronological age held constant. Apparently, so far at least as our particular groups are concerned, general intelligence (defined as the capacity measured by the ordinary group intelligence test) has little influence in determining one's beliefs in the causation of many mental and natural phenomena. This result is again in line with that obtained by Nixon, who remarks: "While no correlations of class grades or intelligence scores with the number marked as true on this test have been made, it is interesting to note that some students who marked

20 or more statements (as true) have done very creditable class work."

This lack of correlation between intelligence and credulity seems to the writers to be the most significant result of this brief study. If our beliefs as to the causation of much in human behavior and natural happenings, as well as in the efficacy of certain signs and omens are not conditioned by intelligence, what, then, does determine them? The answer is not a simple one. Probably the largest single factor—as we indicated above—is lack of adequate information. The negroes of the South, as well as the white Nordics of the Tennessee mountains and the Kansas wheat fields are notoriously superstitious—and densely ignorant. That this is not the whole story, however, is indicated by the fact that many intelligent and fairly well educated people in New York City also believe in prenatal influence, that a square jaw is a sign of will-power, and that women are by nature purer and better than men. Others believe that we have an instinctive knowledge of good and evil, and that by faith we can heal a broken limb. Such ideas probably date back to childhood when the individual accepted them ready-made from his parents, the servants, and, unfortunately, in many cases from his religious teachers. Many have a strong emotional value for the individual who holds them. Uncritically received and acted upon, they have become well established habits which the individual finds hard to shake off, even when he grudgingly admits their improbability. In a sense they are a form of adjustment—albeit a primitive one—a means of putting oneself in rapport with a complex and little understood environment. Probably nowhere else do we see more clearly the clean-cut distinction between the fundamentalist and the scientist—between the naïve, uncritical, and mystical view of life and the scientific, rationalistic one.

We have not considered in this study the ways in which popular misconceptions and superstitions arise. For an account the reader is referred to Jastrow (5) and W. D. Howell (6).

REFERENCES

(1) PETERS, J. L.: Superstitions among American girls. Ped. Sem., 1916, 23, 445–451.
(2) DRESSLAR, F. B.: Suggestions on the psychology of superstition. Amer. Jour. Insan., 1910, 213–226.
(3) CONKLIN, E. S.: Superstitious belief and practice among college students. Amer. Jour. Psych., 1919, 30, 83–102.
(4) NIXON, H. K.: Popular answers to some psychological questions. Amer. Jour. Psych., 1925, 36, 418–423.
(5) JASTROW, JOSEPH: Fact and Fable in Psychology, 1900.
(6) HOWELL, W. D.: Myths and Myth Makers, 1831.

RATINGS OF DOWNEY WILL-TEMPERAMENT TRAITS

GEORGE D. STODDARD AND G. M. RUCH

University of Iowa

PURPOSE OF STUDY

The aims of the present investigation were two in number: (*a*) to determine the extent to which persons can recognize in themselves and in friends with whom they have intimate contact the Downey will-temperament traits; and (*b*) the extent to which ratings of the Downey traits by means of personal judgments on self and on friends is related to the measurement of these traits by the Downey Group Will-Temperament Test.

SUBJECTS

Fifty-four college students were used; 24 men in one fraternity, and 30 women in one sorority. All classes from freshman to senior were represented.

METHOD

Two phases of the investigation are outlined below:

a. The Downey Will-Temperament Test was given to both fraternity groups.

b. Several weeks later the descriptions of the twelve Downey traits ("Sheet 1"), trait by trait, were read by the examiner to the subjects. Each subject was asked to rate himself or herself and his or her two roommates in accordance with the sheet of directions ("Sheet 2"). The examiner supplemented the descriptions by the reading of quotations from Downey's book. When each subject was satisfied as to the meaning of the trait, no further communication was permitted.

Each rated as adequately as he could in the light of his own judgment.

c. Profiles were drawn in which the rating of the test for each trait was indicated by a solid line, and the average rating of self + roommate A + roommate B was shown by a dotted line on the same chart. Both lines were labelled clearly. These profile charts were then sorted into groups of five each in such a way that each subject was presented with his own profile, that of his roommate A, that of his roommate B, and two others from his own fraternity. (Each person had lived with his roommates at least one-half year; frequently much longer.)

d. A reward of one dollar was offered to any student who could, after as much deliberation as desired, pick out from the group of five profiles the *two* representing himself and *either one* of his two roommates. It was evident that each tried to earn the reward.

RESULTS

Three persons out of the thirty girls succeeded in choosing correctly herself and either one of her roommates. (The men were not given the opportunity to select the profiles.) Since the element of chance alone will account for a certain number of successes in thirty such drawings, it is necessary to state the probabilities for and against the earning of the reward as a sheer matter of chance.

Let S represent the person's own profile; A represent the profile of the person's roommate A; B represent the profile of the person's roommate B; X represent the profile of some other sorority sister; Y represent a profile of some other sorority sister.

By chance, the following pairs of drawings would be possible, taking the profiles two at a time as the conditions stated: SA, SB, SX, SY, AB, AX, AY, BX, BY, XY. Of these, SA and SB would receive the reward. The probabilities stand, therefore, 2:10 or 1:5 in favor of chance success. In thirty trials, the expected number of successes would be $30 \times \frac{1}{5} =$

6.0. The probable error of this determination is given by the formula,

$$\text{P.E.} = 0.6745\sqrt{n\,p\,q} = 0.6745\sqrt{30 \times 0.20 \times 0.80} = 1.5$$

The number of actual successes was 3.0, the expectancy is 6.0 ± 1.5, and the actual successes fall short of the number attributable to chance alone by about 2 P.E. It must be concluded therefore that there was exhibited no indication that a person can select either his own or an intimate acquaintance's profile.

TABLE 1

Correlations of ratings and test scores for all subjects

(30 women ans 24 men)

TRAIT	r_{CD}	r_{SA}	r_{SB}	r_{AB}
1	0.15 ±0.09	0.14 ±0.09	0.20 ±0.09	0.20 ±0.09
2	0.00 ±0.09	0.20 ±0.09	0.22 ±0.09	−0.01 ±0.09
3	0.01 ±0.09	0.66 ±0.05	0.63 ±0.05	0.32 ±0.08
4	0.00 ±0.09	0.00 ±0.09	0.33 ±0.08	0.08 ±0.09
5	0.10 ±0.09	0.00 ±0.09	0.16 ±0.09	0.18 ±0.09
6	−0.15 ±0.09	0.30 ±0.08	0.45 ±0.07	0.28 ±0.08
7	0.17 ±0.09	0.39 ±0.08	0.68 ±0.05	0.72 ±0.05
8	0.08 ±0.09	0.09 ±0.09	0.19 ±0.09	0.43 ±0.07
9	−0.06 ±0.09	0.30 ±0.08	0.47 ±0.07	0.35 ±0.08
10	0.14 ±0.09	0.20 ±0.09	0.12 ±0.09	0.21 ±0.09
11	−0.14 ±0.09	0.35 ±0.08	0.40 ±0.07	0.25 ±0.08
12	0.16 ±0.09	0.29 ±0.08	0.31 ±0.08	0.49 ±0.05
Means.....	0.04	0.24	0.35	0.29

Table 1 presents the correlations of the twelve trait scores on the tests with the ratings of self and roommates, and of the ratings of self vs. roommates, and of roommates vs. roommates.

The following symbols are used as subscripts in table 1:

D scores on the Downey tests
S ratings of the subject by himself
A ratings of the subject by roommate A
B ratings of the subject by roommate B
C composite rating of self and two roommates, thus $\frac{S + A + B}{3}$

CONCLUSIONS

1. There is no trait which shows a significant correlation of test scores and the composite rating of self and two associates. Whatever the test measures, the traits are not made clear to college students by means of the verbal descriptions which are given by the author of the test. Or else, the definitions of will traits furnished by the tests have nothing in common with the students' judgments of such traits in their intimate friends.

2. In seven of the traits, nevertheless, the students show considerable evidence of agreement on what a trait is, and in their judgments of the ratings of themselves and their fellows on these traits. The seven significant average correlations (averages of last three columns) from table 1 are:

	Average r
3. Flexibility	0.54
6. Self-confidence	0.34
7. Non-compliance	0.60
8. Finality of judgment	0.24
9. Motor inhibition	0.37
11. Coördination of impulses	0.33
12. Volitional perseveration	0.36

3. The student-student ratings show more tendency to be consistent among themselves (average r's 0.24, 0.35, and 0.29) than are the test-ratings (average r 0.04).

4. No evidence was found that a person can identify the profile of himself or an intimate acquaintance.

These negative results gain significance through the following considerations:

1. A real attempt was made to clarify the descriptions of each trait immediately prior to the registering of student judgments.

2. All raters were relatively mature college students and gave every evidence of sincerity and honesty of effort.

3. Each had previously taken the Downey test; this serving as a good working definition of the traits to be rated.

4. Each rated himself or a roommate intimately known to him during an association of one-half to three and one-half years.

5. A uniform rating scale was used which paralleled exactly the units employed by the tests.

SHEET 1

Explanation of the Significance of the "Traits"

Note: A score of 10 is the highest given. It would be received by the highest 10 per cent in a group of 100. Likewise a score of 1 would be received by the lowest 10 per cent of a group of 100.

1. *Speed of Movement:* The speed of movement relative to the size and age of the person scored.
2. *Freedom from Inertia or Load:* Tendency to work at one's highest speed without external pressure; little tendency to relax speed; quickness in warming up to a task.
3. *Flexibility:* Ease and success in readjustment; capacity to modify one's routine reactions.
4. *Speed of Decision:* Quickness in reaching a decision or conclusion. A slow reaction here may be due to caution or conservatism in weighing the elements involved in a situation, or be caused by one's being side-tracked by irrelevant matters, or by a rambling procedure.
5. *Motor Impulsion:* This trait refers both to impetuosity and energy of reactions. Consider the ease with which brakes or inhibitions are removed and also the tendency to an explosive reaction when the brakes are actually off.
6. *Assurance or Self-Confidence:* This refers to the degree of confidence with which one maintains his opinion against contradiction. A *9* or a *10* reaction signifies an aggressive reaction—the burden of proof being thrown on the person doing the contradicting; *7* and *8* are confident reactions but reasons are often cited for one's confidence and the burden of proof is accepted; *5* and *6* are tactful reactions; and below *5* there is a grading down to complete failure to assert one's own opinion.
7. *Resistance or Non-Compliance:* The vigor with which one reacts immediately to a blocking of one's purpose. It grades from strenuous reaction to complete passivity in the face of opposition.
8. *Finality of Judgment:* Care used in making final judgments, or, assurance of correctness of first judgments.
9. *Motor Inhibition:* Capacity to keep in mind a set purpose and to achieve it *slowly*. It involves power of motor control, imperturbability, and patience.
10. *Interest in Detail:* Attention to details. This trait is not equivalent to accuracy which usually carries an implication of power of keen analysis. One may possess great capacity for detail and yet lack penetration in the selection of details. Care for detail is more evident in the execution of a plan than in cleverness in making a plan.
11. *Coördination of Impulses:* Capacity to execute a double task without a preliminary trial; capacity to handle a complex situation without

forgetting either factor involved. This trait is probably allied to keeping one's head in a confusing situation.

12. *Volitional Perseveration:* Persistence in efforts. Willingness to make repeated trials at betterment of effort in doing a task of some difficulty.

SHEET 2

Rating Form for Will Traits

Date.....Name of Rater.....

Directions: Read over the descriptions of the traits on the sheets of instruction carefully. The trait descriptions are verbatim quotations and hence cannot be modified or amplified for present purposes.

Note 1. *Try to use every point on the scale, i.e., all the degrees from 1 to 10. This is the only way that valid and discriminating ratings can be secured.*

Note 2. It is usually advisable to rate all subjects on Trait 1, then on Trait 2, etc., rather than attempting to rate the traits in order for one subject before proceeding to the next subject.

Note 3. *Enter your rating in the columns below; taking care that your rating on Trait 1 is in the column for Trait 1, that for Trait 2 in the column for Trait 2, etc.*

NAME OF SUBJECT	TRAITS (SEE INSTRUCTION SHEET FOR NUMBERING)											
	1	2	3	4	5	6	7	8	9	10	11	12
1.....												
2.....												
3.....												
4.....												
5.....												
6.....												
7.....												
8.....												
9.....												
10.....												

THE OPINIONS OF COLLEGE STUDENTS

EDWARD S. JONES

University of Buffalo

The opinions of college students may have very little effect on the course of the world. Obviously they reflect the early environment in which these students have been nurtured, plus a certain amount of reading with deliberations. But such opinions may still be worthy of our study from two points of view. They may show us to some extent the influence that college training is having on student opinion. They may also give us valuable indications of the intelligence or other characteristics of individual students.

It is not entirely correct to say that a man's opinions will determine his actions, but there are certain ideas, or beliefs which set a limit to behavior. A man who is decidedly liberal in the conceptions of religion, i.e., one who is decidedly skeptical regarding the divinity of Christ and personal immortality, will have difficulties to say the least if engaged in religious or social work under a thoroughly conservative individual.

But radicalism or liberalism is not all that counts in the field of ideas. There is also the question of how certain a person is, how strongly convinced he is. To be positive and certain of one's convictions is a valuable trait in many situations. It is undoubtedly valuable for the executive who must make plans and carry them through. A point of view thoroughly believed in lies more or less consciously in the background as an organizing force for other ideas or viewpoints. If I am once thoroughly convinced that large inherited masses of wealth are unjust, my whole set of economic ideas may become organized about this one. It is well known that ideas are inter-locked in this way, although there may be some curious contradictions in individuals.

Another value in holding certain positive convictions is the fact that the individual is released for other things. It is mental economy to have settled a point, and not hold it in reserve for further consideration. It is conceivable that men can accomplish more when they first read a new research, if they take the attitude of Darwin, who said that his first tendency was to believe wholly in the validity of the writer's view. It was only at a later reading that a spirit of cautious skepticism crept in.

Your Opinions and Convictions

Consider each of the statements below. If you are strongly convinced that a statement is true, underscore "2" on the extreme left. For example before the statement "the world is approximately a sphere," you would probably underscore "2" because you have evidence, or are otherwise sure of it. Underscoring "1" means that you are fairly certain a statement is true, or that it is more right than wrong. If you draw a line under "0," it means that you are entirely uncertain, that you have no opinion on the subject. Underscoring "−1" means that you consider it more wrong than right, and "−2" indicates that the statement is entirely false, that no reasonable person would consider it true.

2 1 0 −1 −2 There is more justice and real democracy in the United States than in any other country in the world.

2 1 0 −1 −2 The young people of today are no more immoral than the young of two or three decades ago.

2 1 0 −1 −2 Bluffing is poor policy in professional life. The better doctors, lawyers and business men avoid it.

2 1 0 −1 −2 The world at present is more wholesome than at any other period. Men are more unselfish and social-minded.

2 1 0 −1 −2 Modern advertising is a social blessing.

2 1 0 −1 −2 Our government is controlled by great financial interests.

2 1 0 −1 −2 Working men should organize into labor unions. It is the only method to insure fair treatment.

2 1 0 −1 −2 The expert mechanic should get about the same as the business executive.

2 1 0 −1 −2 Newspapers are afraid to tell the truth. They are over-influenced by men of wealth and special privilege.

2 1 0 −1 −2 Poor men cannot get justice in the courts.

2 1 0 −1 −2 One cannot be healthy and at the same time smoke tobacco and drink strong coffee.
2 1 0 −1 −2 The man who persists in exceeding the speed limit on the public highways should be jailed like other criminals.
2 1 0 −1 −2 A student in high school or college caught cheating in an examination should be suspended from school.
2 1 0 −1 −2 First degree murderers, when caught, properly tried and convicted, should be executed.
2 1 0 −1 −2 High school students today are not required to work (study) as hard as they should for their own good.

2 1 0 −1 −2 It is better to have a world full of clever happy men without ideals than stupid unhappy men with ideals.
2 1 0 −1 −2 The thrill and romance from moving pictures are good substitutes for social life and other recreations.
2 1 0 −1 −2 It is harmless for young people who are not engaged to kiss each other secretly.
2 1 0 −1 −2 People who are unhappily mated should be allowed a divorce even when there is no adultery.
2 1 0 −1 −2 Dancing is more apt to be morally good for one than bad. The ill effects on one's thoughts are rare.

2 1 0 −1 −2 Where religion is antagonistic to modern science, religion should be allowed precedence.
2 1 0 −1 −2 It is better for a teacher to teach unproved truth than error which he earnestly supports with evidence.
2 1 0 −1 −2 The religious missionary is on the average the great altruist, as he is thinking only of the good of others.
2 1 0 −1 −2 There is plenty of justification for the belief in a life after death.
2 1 0 −1 −2 Man was created directly by God, and not indirectly from lower animal forms as evolution teaches.

A high degree of certainty in various common ideas may, however, make a man less valuable in many occupations. He is no doubt less pliable in fitting into the attitudes of an

organization. He may make a poor administrator in certain fields where ideas are changing rapidly.

Another distinction which is available in considering a man's attitudes or opinions is his tendency to avoid any opinion. Out of 25 questions, one student will have opinions for or against the issue in 23 cases and complete doubt or indifference in only two; another student has opinions in only 13 of the cases. A high index of doubt signifies caution, but more than that probably a degree of narrowness in the questions concerned.

One other trait which is discernible in many students is the tendency to accept a statement in its positive form. In other words certain students are highly suggestible in that they react in favor of ideas or statements, while others are inclined rather to oppose statements as presented to them.

The set of 25 statements, with instructions, found on page 428f, were given to 248 college freshmen, 76 upper class students (almost entirely seniors), and 94 students in the midst of their second year of law. The law students were selected for two reasons: (1) these men are to deal primarily with social and political situations, where abstract social opinions count or at least are often considered; (2) it was suspected in going over the blanks submitted to freshmen that those students electing to follow medicine or a branch of science differed in the nature of their responses from those students who hoped to take up law. Hence it was thought there might be a legal type which should be taken into account by a personnel office.

The 25 questions divide up into five groups of five questions each. The first five deal with questions of national and social optimism. The second set are on the labor problem and economic status in general. A third group deals with discipline, a fourth with social life and the conventions, while the fifth is in the religious field.

An outstanding feature is the wide range of responses to every statement given. Hardly a statement escapes being scored under all five headings: -2, -1, 0, 1, 2. To be sure, some statements are marked preponderantly plus while others are scored minus, but an average score for a question has practically

no meaning on account of the wide range of reactions to each. For example on the statement "Our government is controlled by great financial interests" the results of the 418 answers are:

Strongly convinced	59
More true than false	136
Uncertain	55
More false than true	103
Convinced it is wrong	65

The most significant general educational implication is the slight effect that a college training has had on the real opinions of our students who are now seniors in the Arts and Science college. There is almost as large a proportion in the senior class who are conservative or reactionary in their responses as in the freshmen class. Apparently this type of opinion is influenced far more by home training and religious disposition than by what the students are taking away from their college courses.

Only in some questions dealing with economic status and with religion is there any decided difference between seniors and freshmen. In the economic type of question the seniors are apparently more conservative than the freshmen. They tend to believe more generally than do the freshmen that the "expert mechanic should *not* get about the same income as the business executive," and also that "poor men *can* get justice in the courts." That is, the freshmen wabble about the center of the possible responses (perhaps because they are suggestible in favor of positive statements), whereas the seniors choose the negative side of the statement as put in the blank.

Religiously the seniors tend to be far more liberal than the freshmen. On the last two questions of the series particularly, there is a distinct cleavage. Seniors are skeptical (i.e., hover around 0) on the question of life after death, while the freshmen are for the most part convinced that there is plenty of justification for such a belief. Freshmen also lean towards a belief in opposition to evolution, whereas seniors tend to accept evolu-

tion, the men being strongly opposed to the statement as found in the blank. This is true in spite of the fact that the proportion of Protestants, Catholics and Jews remain about the same: approximately 50, 25 and 25 per cent respectively.

The sex differences are also less significant than one might expect. There is a more conservative attitude of the men in economic questions, and a distinctly more conservative attitude among women in the religious questions. In the field of social relationships there is relatively little difference. Men are more inclined than women to be skeptical about the elevating influence of dancing and to want the first degree murderer hung; while women are slightly more apt to feel that divorce is undesirable. Women tend to be more convinced in their opinions than men in the arts college, but less certain on the average than law students of similar age. In all other general respects, there is no significant difference.

Law students in the upper classes do not differ markedly in their opinions from other men. They are somewhat more conservative in economics and also in religion, particularly in the latter field. The majority of law students seemed to be strongly opposed to evolution, whereas very few upper class arts men still hold this belief.

In one other respect there is a difference, in the degree of the certainty of conviction. The law students tend rather strongly to favor plus or minus 2. In fact, 53 per cent of the responses indicate certainty, whereas only 45 per cent of the responses of the arts men show this same certainty. From a different angle, it appears that the median amount of certainty among a group of law students about equals the upper 25 per cent point, according to certainty, for arts students. This difference can be seen plainly in the freshman class as a whole. Freshmen who were considering law as a vocation are considerably more apt to underscore a plus or minus 2 than those who were going into medicine or a science career. Perhaps this is a real hint then for those who are interested in the analysis of personality with a view to vocational guidance.

In attempting to relate the different quantitative values

obtainable from such a study of opinions with the results of intelligence tests, the correlations found were very small. There was a slight positive relationship between intelligence scores (as obtained from the examination of the Educational Research Council) and certainty, and also with the tendency to be radical, but the correlations are all less than 0.20. However this is no reason for disparaging this type of test. "Certainty," for example, appears to have a fairly high reliability coefficient. Even with 25 items, the correlation index between odd and even numbers is 0.71. The more measures we have which are valuable and at the same time poorly related to intelligence the better off we shall be, as they may be used to supplement the results of intelligence testing. What any man does is only partly a product of his intelligence. There are also various emotional factors which may contribute to the degree of one's instability or forcefulness.

"Indifference" and "radicalism" and "suggestibility" are none of them as significant with as small a number as 25 statements. Their coefficients of reliability amount to about 0.5, whereas correlations with intelligence are hardly more than 0.1. There is a slight tendency for the more intelligent man to be more radical and more positive but less suggestible than the average.

The analysis of individual records shows decidedly interesting and characteristic bents, at least for the senior students whom we have come to know quite well. Here is a senior, brilliant, artistically inclined, with an intense desire to be a teacher of English in a college. He is inclined to be strongly convinced of his point of view, and radical on most questions, though in spots he takes a strictly conservative attitude. He is not consistent with himself in spite of strong convictions and no feelings of indifference or doubt. His teachers know this man to be a most interesting student. He shows brilliant analyses and raises interesting questions in a class room. He does not conform to any pattern, but seems often prejudiced by minor items. He will doubtless be a creative contributor in one or more of the fields of art, perhaps because he is not bothered by consistency.

Another man of the senior class, typically a scientist, is extremely cautious in all his attitudes. He is really convinced of the truth of but few of the statements, but is thoroughly consistent when he does react. In the case of eight of the 25 statements, he underscored "0" which means that he has no fixed opinion. This man is known around college to be somewhat narrow, decidedly timid in his expressions, but one of the two or three ablest men in the group interested in science. He is being considered for an assistantship in one of the departments.

An attractive girl of fair scholarship but with a particular bent toward social leadership and with occasional high grades, showing superior insight in certain courses, has been invited to go into church work with a very conservative religious group. She, however, is thinking seriously of teaching. A glimpse of her reactions to this outline are interesting. She is 64 per cent liberal in her views, particularly in religion. She takes two attitudes which would seem to interfere seriously with her happiness and interest in continuance in religious work. She believes that where there is a conflict between religion and modern science, religion should *not* have precedence. Then she strongly believes that a world full of clever happy men without ideals would be superior to stupid unhappy men with ideals. She also is inclined to doubt a justification in a belief in life after death.

Certainly this combination of beliefs would be unfortunate in a conservative religious organization.

One senior who has been a very well liked leader among the girls, shows herself up as strongly disposed to accept the positive side of all statements. She has only scored the negative side in four statements. In spite of a fine liberal enthusiastic attitude, she is apparently so suggestible as to allow a statement to swing her to the point of inconsistency.

A very superior science student has a large per cent of "0" and "1" underscored, but she is strictly consistent. She is particularly a severe disciplinarian, but otherwise inclined to be quite liberal.

It is significant that professors who come into the personnel office of the university do repeatedly turn to the reactions of students to these statements. They are, in fact more interested

TABLE 1

		ARTS WOMEN	ARTS MEN	LAW MEN
Questions of:				
Optimism	(1)	+	+	+
	(2)	+	+	0
	(3)	+	+	+
	(4)	0	0	0
	(5)	0	0	0
Economic (Labor Attitudes)	(6)	0	0	−
	(7)	+	+	+
	(8)	0	−	−
	(9)	+	0	0
	(10)	−	−	−
Discipline	(11)	0	0	−
	(12)	+	+	+
	(13)	+	+	+
	(14)	0	+	0
	(15)	0	+	0
Social Conventions	(16)	−	0	0
	(17)	−	−	−
	(18)	0	0	0
	(19)	+	+	0
	(20)	+	+	+
Religion	(21)	0	0	0
	(22)	0	0	+
	(23)	+	0	+
	(24)	+	0	+
	(25)	0	−	+

in them than in the number or type of books read, the subjects of greatest interest in high school, religion, scores of intelligence tests, and a host of other things which are available in the folders for each student.

An employer interviewing a prospective candidate in teaching wants to know what she thinks, or what her opinion is. Unquestionably an evaluation of personnel opinions can be made a part of the scientific study of personality.

TABLE 2

Percentage of statements underscored indicating complete doubt, certainty, positiveness and radicalism

	NUMBER OF CASES	COMPLETE DOUBT (PER CENT "0")	CERTAINTY (PER CENT "2" OR "−2")	POSITIVENESS (PER CENT "1" OR "2")	RADICALISM
Women freshmen	78	10.5	51	62	32
Women seniors	54	8.4	46	58	45
Men freshmen	170	13.5	46	62	32
Men seniors	22	9.2	44	55	40
Men law students	94	6.9	53	57	35
	418				

Table 1 gives a summary of the commonest attitude of men in the arts college, women in arts, and men in law school, for each of the 25 statements as listed. The symbol "+" indicates a distinct leaning in favor of the positive statement, "0" indicates no definite swing to either side, while "−" stands for an attitude in opposition to the statement. Table 2 summarizes certain general tendencies.

MENTAL FATIGUE OF INDIANS OF NOMADIC AND SEDENTARY TRIBES[1]

THOMAS R. GARTH

University of Denver

Previous studies of mental fatigue among races indicate that there are racial differences in this phase of mental work as between full-blood Indians of nomadic tribes, whites and negroes. Particularly in respect to accurate performance is this found to be true since the measures of differences, as taken from the overlapping run, using the white medians as bases, for Indians, the young ones, 70.4 per cent, the older ones, 63 per cent; for negroes, the young ones, 19.3 per cent, the older ones, 14.5 per cent (1). When we consider mixed-blood Indians in respect to mental fatigue we find that in accurate performance, they seem to occupy a middle ground between whites (2) and full-blood Indians though in attempted performance they tend to be more speedy than the whites and less speedy than the full bloods, by this same measure of overlapping (3).

The question arises as to whether or not this may be said to hold of sedentary Indians as well as of those of nomadic tribes. On a basis of actual scores, with intelligence tests—N. I. T. Scale A—it was found by the writer that age for age the nomadic Indians are more intelligent than the sedentary Indians (4), though to be sure, social status and proximity to representatives of the white civilization favored the nomadic tribes here examined more than the sedentary tribes.

The nature of a correlation between ability to hold to a mental task such as the one made use of in the present experiment

[1] Paper read before the American Psychological Association, December, 1923, at Madison, Wisconsin.

and intelligence is as yet unknown. It is a problem whose solution may be undertaken later on. However, the results appear on the face of things to indicate that there is no correlation of a significantly positive sort as respects intelligence of nomadic full-blood Indians, mixed bloods, and whites as racial groups because measures of intelligence of these groups show just the opposite tendency as compared with the tendency in measures of mental fatigue. Thus it would seem that the work curve test used in the present experiment does not measure intelligence though the results indicate racial differences in the work curve.

In this study our problem is: If full-blood Indians of nomadic tribes are able to resist the onset of mental fatigue as here measured more successfully than whites, or mixed bloods —representing a mixture of white blood and nomadic Indian blood—is it just a matter of Indian blood so regarded or could it be due to the tribal habit of nomadism as distinguished from that of sedentary practices?[2]

We do not mean at all to attack here the problem of acquired characteristics. That would be too large a task just now. But we wish in fact to avoid facing such a biological problem by saying that the Law of Survival of the Fittest could easily account for any difference here to be found in comparing nomadic and sedentary Indians since the law would work with more rigor among nomadic Indians than among those of sedentary habits. Nor would we go back of the bare statement of fact of Indian blood to its origins, rather would we leave that for the anthropologist. We are merely granting tentatively that the origins of the Indian bloods here considered are the same, and following that we are saying that some of its ancestry followed nomadic habits and some sedentary habits.[3]

[2] The data for the sedentary Indians were obtained by the writer on an expedition made possible by courtesy of the Grants Committee of the American Association for the Advancement of Science.

[3] The classification of these Indians as nomadic and sedentary was made at the suggestion of Prof. James E. Pearce, Professor of Anthropology, University of Texas.

From an interest in what was going on in the minds of the subjects in addition to the originally behavioristic phase of this study we have undertaken to find out something of the subjective states of these psychologically untutored subjects and as a matter of sheer curiosity we obtained from them something like introspection at the end of the experiment.

The materials of the experiment were the Thorndike Addition Sheets arranged in two kinds of tablets, that is of fourteen sheets and twenty-one sheets respectively, the tablets of fourteen sheets being used by younger subjects and the ones with twenty-one sheets being used by the older subjects. The subjects were full-blood Plains and Southeastern Indians and Pueblo, or Plateau Indians found in the United States Indian Schools of Chilocco, Oklahoma and Albuquerque, Mew Mexico; the Chilocco Indians, representing the nomadic Indians and the Albuquerque Indians the sedentary Indians. The subjects of the younger sub-groups of Indians had attained as high as fourth grade—excepting five of these—in the United States Indian Schools and those of the older sub-groups had attained the seventh and eighth grades in these schools.

The ages of the nomadic group averaged for the younger and older subjects 15.7 and 18.3 years respectively. In the sedentary sub-groups the average for the younger subjects was 11.8 years and for the older subjects it was 16.2 years. Following we have the grade composition:

BLOOD GROUPS	NUMBER IN THIRD GRADE	NUMBER IN FOURTH GRADE	NUMBER IN FIFTH GRADE	NUMBER IN SEVENTH GRADE	NUMBER IN EIGHTH GRADE
Nomadics	5	54	2	27	20
Sedentary		57		45	21

This gives for the younger subjects: Nomadics, 61; sedentary Indians, 57; and for the older subjects we have, nomadics, 47; sedentary Indians, 66. Both nomadic and sedentary groups are to be regarded as composed of full bloods altogether if we may take the statement of degree of blood from the United

States Indian School records and the statements of the subjects themselves.

The sexes are about equally distributed, as follows:

	YOUNGER SUBJECTS		OLDER SUBJECTS	
	Males	Females	Males	Females
Nomadics	25	34	31	17
Sedentary	31	26	29	37

The work curve experiment has been described elsewhere as to its administration (1). The younger and older subjects work continuously for twenty-eight and forty-two minutes respectively. At the start their good-will is obtained by getting their consent to see who is the "best adder in the class" and the experiment is playfully characterized as a "race." No interruption on the outside or interference of any sort is permitted while the performance is going on. No motivation in addition to what is offered at the start is given at any subsequent time during the work period. In fact great pains are taken to keep the conditions of the experiment constant so that the individual subject's internal efficiency as a worker will be indicated by the results on the data sheets. Only two minutes are spent on a sheet and every subject works on the same sheet each two minutes. At the end of the experiment the subjects were asked to write on the work curve tablets whether they were "not tired," "a little tired," just "tired," or "very tired." To be sure the subjects are inexperienced introspectionists but we offer this for what it is worth.

The original data for this experiment were found in the tablets after the subjects had carried out the instructions. The data were handled thus:

1. To ascertain the number of columns a subject attempted each two minutes.

2. To find out what was accurately performed each two minutes.

3. Attempted columns and accurate columns for an individual were totaled.

4. From these totals were obtained the per cent accurate for each two minutes and likewise the per cent attempted for each two minutes.

5. Number 4 gave what we have called individual work curves expressed as per cents.

TABLE 1

Showing average of the individual curves for fourth grade full-blood Pueblo (sedentary) Indians

PERIODS	PER CENT ATTEMPTED			PER CENT ACCURATE		
	Average	A.D.	P.E.	Average	A.D.	P.E.
1	7.1	1.7	0.2	8.1	5.8	0.6
2	6.8	1.1	0.1	8.7	4.8	0.5
3	7.3	1.8	0.2	7.7	4.3	0.4
4	7.2	1.4	0.1	8.8	4.6	0.5
5	6.8	1.4	0.1	6.7	3.7	0.4
6	7.5	1.1	0.1	7.9	4.6	0.5
7	6.1	1.1	0.1	5.5	3.5	0.4
8	6.2	1.1	0.1	5.1	3.6	0.4
9	6.5	0.6	0.1	7.0	4.6	0.5
10	7.8	1.1	0.1	6.5	4.5	0.5
11.	7.7	1.3	0.1	8.2	5.2	0.6
12	7.3	1.5	0.2	8.4	6.2	0.7
13	7.4	0.8	0.1	6.4	4.1	0.5
14	7.5	0.6	0.2	6.4	4.6	0.5

6. These individual curves, as in number 5, were combined into group curves called the average of the individual curves. This made group curves of per cents of total attempted and accurate performance, i.e., two curves for any sub-group of subjects. Table 1 will show the data[4] for the curve for attempted and accurate performance of the sedentary sub-

[4] The data for all blood groups except that of Pueblo Indians has been previously published in Journal of Applied Psychology, vol. iv, pp. 242, and vol. vi, pp. 336.

groups of fourth grade and table 2 will give the data for attempted and accurate performance of seventh and eighth grade sub-group. These data are in the form of average, average deviation, and probable error of per cents for each two minutes.[5]

TABLE 2

Showing average of the individual curves for seventh and eighth grade full-blood Pueblo (sedentary) Indians

PERIODS	PER CENT ATTEMPTED			PER CENT ACCURATE		
	Average	A.D.	P.E.	Average	A.D.	P.E.
1	5.5	1.1	0.1	6.1	2.5	0.3
2	4.4	0.8	0.08	5.5	2.5	0.2
3	4.8	0.8	0.07	5.5	2.3	0.2
4	4.8	0.8	0.09	5.8	2.1	0.2
5	4.3	0.9	0.08	4.3	1.6	0.1
6	4.6	0.7	0.06	5.1	3.3	0.3
7	4.3	0.6	0.04	4.3	1.8	0.2
8	4.6	0.4	0.08	4.2	2.1	0.2
9	4.7	0.7	0.08	4.1	2.1	0.2
10	4.5	0.8	0.10	3.8	1.8	0.2
11	4.6	0.9	0.08	4.0	1.9	0.2
12	4.6	0.8	0.04	4.2	1.9	0.2
13	4.8	0.4	0.09	4.3	2.7	0.3
14	4.3	0.8	0.04	4.0	2.2	0.2
15	4.9	0.4	0.07	4.2	1.7	0.1
16	4.8	0.7	0.06	4.6	2.0	0.2
17	4.8	0.6	0.10	5.2	1.6	0.1
18	5.2	0.9	0.07	4.9	1.8	0.2
19	4.4	0.7	0.11	4.2	2.4	0.3
20	5.4	1.0	0.12	4.8	2.4	0.2
21	4.8	1.1	0.12	4.1	2.2	0.2

Figures 1, 2, 3, and 4 give a graphic representation of attempted and accurate performance for the younger and older sub-groups in the form of smoothed-out curves.

[5] The writer acknowledges the assistance of two of his graduate students, Miss Helen G. Mercer and Miss Florence Mercer in handling the data for the sedentary Indians.

It will be seen that the curves for nomadic full-blood Indians are somewhat different from those of the full-blood sedentary especially in the case of those representing efficiency

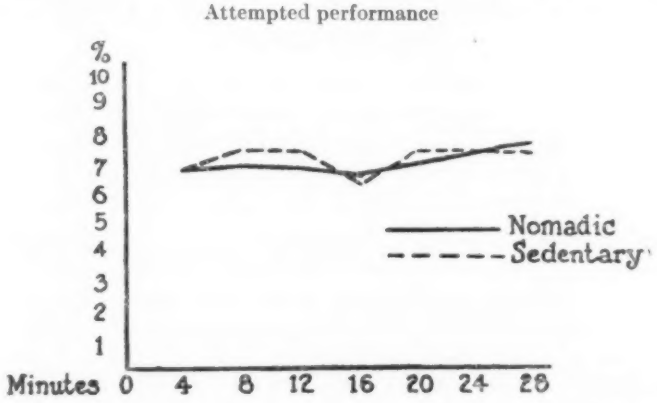


FIG. 1. AVERAGE OF THE INDIVIDUAL CURVES FOR YOUNGER SUBJECTS

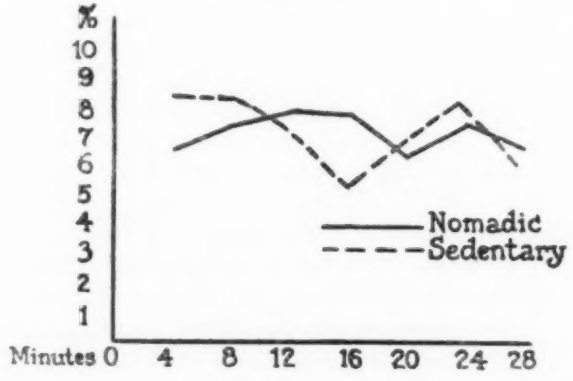


FIG. 2. AVERAGE OF THE INDIVIDUAL CURVES FOR YOUNGER SUBJECTS

during the accurate performance. In all curves the sedentary Indians tended to do more of the work at the start than did the nomadic Indians. With the former we find a tendency toward initial spurt in all the curves but the attempts curve of

the younger subjects while there is warming-up indicated with the latter. If we take into consideration the curves at the ends we note that always the nomadics are better than the sedentary subjects though sometimes there is only a slight advan-

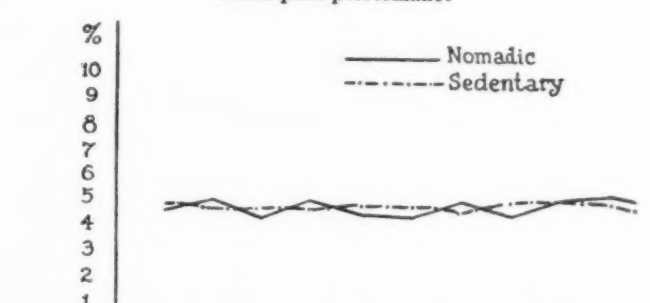


FIG. 3. AVERAGE OF THE INDIVIDUAL CURVES FOR OLDER SUBJECTS

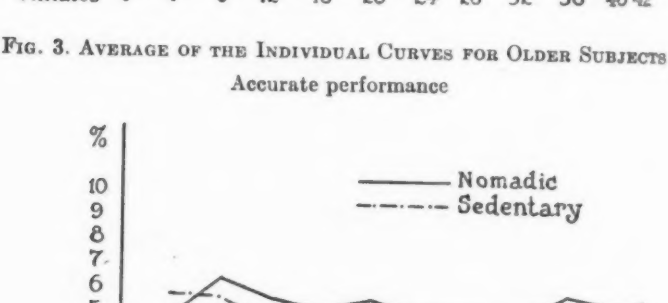


FIG. 4. AVERAGE OF THE INDIVIDUAL CURVES FOR OLDER SUBJECTS

tage as in the case of the two curves for attempted performance for the younger subjects. The curves for efficiency during the attempted performance are more nearly similar than are those representing that for the accurate performance. They also appear to fluctuate less, however, from the appearance of the

curves themselves merely, the nomadic sub-groups seeming to have the advantage over the sedentary Indians. The former appear to get more practice effect as indicated by the curve slopes than the latter.

The term "mental fatigue" is used here in a restricted sense and not in the way in which the popular mind regards it. Even the word "mental" has had its purgings until the dynamic psychologist and the untutored person may converse only with embarrassment. Since the situation in this experiment was so planned that external factors could scarcely hinder the performance once started and all hindrances to work setting in later must be of an internal and subjective nature set up by the performance, i.e., actual loss of neural efficiency, ennui due to the task, interference of mental processes, such as perseveration and overlapping, feeling of being tired due to distraction, of actual physical fatigue induced by strain, the annoyance of inhibiting tendencies to do something else besides the task in hand; and since these internal and subjective states are probably bigger factors than the mere motor processes of writing included in the performance whose results measure in terms of speed and accuracy in an objective fashion the mental work as handicapped by the above mentioned internal states, we may with these qualifications, say that the objective results measure an internal condition of efficiency (5) and may call the loss of efficiency an internal or "mental fatigue." To be sure this complex is not the old mental fatigue of the popular mind.

We take here as a measure of loss of efficiency the results of a comparison of efficiency at start and finish of the total continuous work period. By referring to table 3 we find that the nomadic Indians excel the sedentary Indians in resisting fatigue in both attempts and accurates categories, but more in the latter than in the former. In attempts for the nomadic younger sub-group there was a gain of 6.8 per cent, while for the younger sedentary Indians there was a gain of 4.7 per cent; and in the accurates category the figures stand 8 per cent gain for the former and 13.4 per cent loss for the latter. For the

older sub-group the nomads experienced in attempts a gain of 5.9 per cent and the sedentary subjects of that sub-group a loss of 1 per cent. In accurate performance for the older sub-groups the nomadics had a gain of 0.3 per cent and the sedentary subjects suffered a loss of 23.4 per cent. It is interesting to note that though the younger sedentary Indians are younger than the nomadic younger Indians on the average 3.9 years and the older sedentary Indians are only 0.9 of a year younger on the average than the corresponding nomadics, still the young sedentary Indians stand closer to the nomadic Indians according to the measure of mental fatigue than do their

TABLE 3

Showing results of comparison of per cents in first and last six minutes of work for nomadic and sedentary full-blood Indians using the first six minutes as a base

	NUMBER OF CASES	ATTEMPTS	ACCURATES
Young subjects:			
Nomadic	61	6.8% gain	8.0% gain
Sedentary	57	4.7% gain	13.4% loss
Older subjects:			
Nomadic	47	5.9% gain	0.3% gain
Sedentary	66	1.0% loss	23.4% loss

older ethnic brothers. In this instance at least age does not seem to favor the latter.

Elsewhere (2) we have discussed the nature of the work curves of whites, negroes and Indians in addition to the facts of fatigue as brought out by the method used above. This was for the purpose of determining statistically if there are really different racial work curves for the subjects studied; just a difference appearing between averages is not to be regarded as a significant difference in comparing group performances. One means of determining such differences is to measure the amount of overlapping of the distribution of one

group over that of the other. This we have done here, having proceeded thus:

1. To tap the work curves at various points so as to find what per cent was done during the first six minutes of work, what was done during first fourteen or the first twenty-two minutes of work for younger and older subjects respectively, and what was done in the last six minutes of work.

2. To take the medians of the distributions from which these parts of the curve were derived and compare them to see if these indicate differences.

TABLE 4

Showing medians of per cents done at various times during total work period for nomadic and sedentary Indians

	FIRST 6 MINUTES		FIRST 14 MINUTES		LAST 6 MINUTES	
	Median attempted	Accurate	Median attempted	Accurate	Median attempted	Accurate
Younger subjects:						
Nomadic	20.5	19.3	48.3	49.5	22.5	20.3
Sedentary	23.8	24.5	50.7	52.5	22.3	18.6
Older subjects:						
Nomadic	14.4	14.0	51.4	53.0	15.2	14.8
Sedentary	15.2	16.8	51.5	55.5	15.1	13.9

3. To test the reliability of the differences by seeing what per cent of one group's measures attain and exceed the median of another.

An examination of table 4 will show the medians of performances for these three phases of the nomadic and sedentary Indians work curves. The medians will be seen to read thus: In attempts category for nomadic younger subjects, first six minutes, 20.5 per cent; for first half, 48.3 per cent; for last six minutes, 22.5 per cent. In this category for the sedentary younger subjects the medians are for first six minutes, 23.8

per cent; first half, 50.7 per cent and for last six minutes, 22.3 per cent. In the accurates category the younger subjects of nomadic group show for the same phases of the curves respectively as above indicated, the medians, 19.3, 49.5, and 20.3 per cent, and the younger subjects of sedentary group show for these same phases respectively, 24.5, 52.5, and 18.6 per cent. That is to say on a basis of comparison of medians alone of these three phases of the two Indian work curves the fact is indicated that the nomadic full-bloods tend:

1. To be more deliberate at start than the sedentary full-bloods, doing a smaller per cent of their work at the start of the game.

2. To show that by the time one-half of the total work period of twenty-eight minutes is up they have not done in either performance category quite one-half of their work but will do more than half of it in the latter half of the total work period; whereas the sedentary Indians are, in both categories, consistently inclined to do more than half of their work, i.e., they are more in a hurry to get through with the task.

3. To show that at the end the nomadic Indians are inclined to do a larger per cent in either category than at the start, whereas the sedentary sub-group tends to do less at the end than at the start and a smaller per cent of its total work in either category than did the nomadic sub-group.

For the older sub-groups we have just about the same situation, but especially is it more emphatic in the case of the accurates category. Here the nomadics tend to go about their work less speedily and more cautiously while the sedentary Indians are rather "excessive" as compared with the nomads in their efforts at the start, but less so in attempts than in accurates. By the middle of the total working period, i.e., here in the first twenty-two minutes of work, the sedentary Indians incline to do a larger per cent of their work than the others in the accurates category, but hardly much more in the attempts. At the end the status is the other way round, being still more emphatic in the accurates category, for the nomads do a larger

per cent at the end than do the sedentary subjects, i.e., they are less "fatigued" as objectively determined.

Table 5 affords measures of the amount of overlapping which are given in order to obtain evidence of significant differences between the racial groups. As already indicated by the comparison of medians of per cents done there are apparent differences. We have found the nomadics consistently excelling the sedentary Indians in both performance categories and for both younger and older subjects. But the crucial test of differences is to see if the per cents of measures of sedentary Indians wherever we tap the curve tend to attain and exceed

TABLE 5

Showing per cent of sedentary sub-groups attaining and exceeding median of respective nomadic sub-group

	FIRST 6 MINUTES		FIRST 14 MINUTES		LAST 6 MINUTES	
	Attempted	Accurate	Attempted	Accurate	Attempted	Accurate
Younger subjects:						
Overlap, per cent	65.5	66.7	65.6	71.9	51.7	40.3
Older subjects:						
Overlap, per cent	62.0	75.8	57.5	66.7	53.3	40.9

the medians of the measures of the nomadic performance in any significant degree. A per cent as measuring the amount of overlapping which departs very far from 50 per cent is more significant the farther above or below that per cent it goes. By referring to the table it will be seen that for work of first six minutes in younger racial groups these measures of overlapping are for attempts, 65.5 per cent and accurates, 66.7 per cent. For older subjects they are respectively 62.0 and 75.8 per cent. So we can say that at the beginning of the curves the differences are significant. At the half-way point, or thereabouts,

TABLE 6

Showing total columns added for the nomadic and sedentary Indians

	ATTEMPTS			ACCURATES		
	Average	A.D.	P.E.	Average	A.D.	P.E.
Younger subjects:						
Nomadic	50.9	15.2	1.7	29.0	13.4	1.5
Sedentary	45.0	12.1	1.5	22.9	11.2	1.4
Older subjects:						
Nomadic	118.0	22.8	2.8	64.1	18.4	3.4
Sedentary	107.8	29.4	2.4	60.8	19.3	3.1

TABLE 7

Showing classification of introspections of the subjects taken at the end of the experiment

	YOUNGER SUBJECTS		OLDER SUBJECTS	
	Number	Per cent	Number	Per cent
For nomadic Indians:				
Number reporting:				
"Not tired"	26	44	20	42
"Little tired"	25	43	25	52
"Tired"	0	0	2	4
"Very tired"	5	9	1	2
No report	3	4	0	0
For sedentary Indians:				
Number reporting:				
"Not tired"	30	53	36	55
"Little tired"	16	28	22	33
"Tired"	4	7	2	3
"Very tired"	7	12	6	9
No report	0	0	0	0

the measures are somewhat less significant, being for attempts and accurates 65.5 and 71.9 per cent respectively for younger sub-groups and 57.5 and 66.7 per cent for the older sub-groups. The measures at the close of the work, last six minutes, are all

significant and in the same direction for both sub-groups in accurates only. For accurates the measures are 40.3 and 40.9 per cent for young and old sub-groups respectively, but for attempts they are 51.7 and 53.3 per cent respectively. However, if in respect to attempts the measures of overlapping do not indicate significant differences, they must indicate more or less similarity of behavior at the ends of the work periods. And this is just what was found when we examined the curves of work in attempts at the end. (See figs. 1 and 2.)

As to the feelings of fatigue reported by these inexperienced and untutored subjects we may look into this by examining table 7 which shows how the reports of these subjects stand in the matter. Here they undertook to say whether they were "not tired," a "little tired," "tired," or "very tired." Some failed to report at all. It will be seen that though of the young and old sub-groups of sedentary Indians 53 and 55 per cent respectively reported that they were not tired and all the rest reported that they were either a "little tired," "tired," or "very tired," and that in this respect they were more optimistic than the nomadic Indians of whom the younger sub-group reported 44 per cent "not tired" and the older sub-group 42 per cent "not tired" and all the rest a "little tired," "tired," or "very tired," the objective results as indicated by the various curves show that they "fatigued" more than the nomadic Indians in fact. This might indicate that the nomadic Indians are more heroic in the face of felt fatigue than were the sedentary Indians for they kept up their performance at least in accurate work more efficiently than did the latter.

By referring to table 6 which is really not a part of the study excepting that it is a useful sidelight it will be seen that the total performance of the nomadics is better for the total work periods than for the sedentary Indians because they added more columns and got more of them right.

SUMMARY

1. In the total columns added either attempted or accurately done the nomadic Indians excelled the sedentary Indians.

2. The sedentary Indians are more given to initial spurts than are the nomadic individuals.

3. The nomadic blood groups are inclined to resist fatigue more successfully than the sedentary blood groups.

4. At the end the sedentary blood groups tend to fall away more than the nomadic groups, but more in accurate performance than in attempted performance.

5. The sedentary subjects were not inclined to acknowledge feelings of fatigue as freely as did the nomadics though they "fatigued" more than the latter.

REFERENCES

(1) GARTH, T. R.: Racial differences in mental fatigue. Journal of Applied Psychology, 1919, 5, 235–244.

(2) GARTH, T. R.: White, Indian, and Negro work curves. Journal of Applied Psychology, 1920, 5, 14–25.

(3) GARTH, T. R.: Mental fatigue of mixed and full-blood indians. Journal of Applied Psychology, 1922, 6, 331–341.

(4) GARTH, T. R.: A comparison of the intelligence of Mexican and mixed and full-blood Indian children. Psychological Review, 1923, 30, 388–401.

(5) THORNDIKE, E. L.: Educational Psychology, vol. iii, pp. 121–122.

THE RELATION BETWEEN PERSONALITY AND CHARACTER TRAITS AND INTELLIGENCE

A Study of a Group of Student Nurses

MARY GOODYEAR EARLE

An attempt has been made in the present study of two hundred and twelve student nurses in seven large hospitals in New York City, to discover if there is a correlation between their general intelligence and their personality and character traits, as exemplified by the so-called "ideal nurse."

Obviously a positive degree of correlation would be an exceedingly desirable finding. Inasmuch as certain personality and character qualities are an absolutely indispensable part of a fine trained nurse it would be worth while in demanding more than "average intelligence" to have some assurance that we were getting the other as well. We now have fairly satisfactory objective measures of intelligence with ever increasing progress along this line, and thus far, no satisfactory measures of personality and character traits. I am aware that there are members of the community who would dispute the assumption that more than "average intelligence" is required in a trained nurse, but those of us thoroughly familiar with this professional problem know that a high standard of nursing care is dependent in a large measure upon the intelligence and judgment of the student nurses who give it, plus the requisite personality and character qualities. Here one draws a sharp distinction between trained nurses and those who "wait upon the sick." The highly trained nurse might so to speak, be called the doctor's surrogate.

The field of the hospital training school for nurses is unplowed and virgin soil for psychological study in general and worthy of the best efforts and most creative thinking of psy-

chologists along several lines. The adequate education and training of the student nurse has at last become a subject of discussion and interest to the public at large and with the establishment of Nursing and Health Departments in several universities of the country, it is rapidly becoming a subject of importance with those of us especially concerned in the education of women along lines of increasing usefulness and service. It is of special significance that Dr. David Snedden, the Educational Sociologist, considers it one of the most interesting and desirable of the professions into which young women can enter!

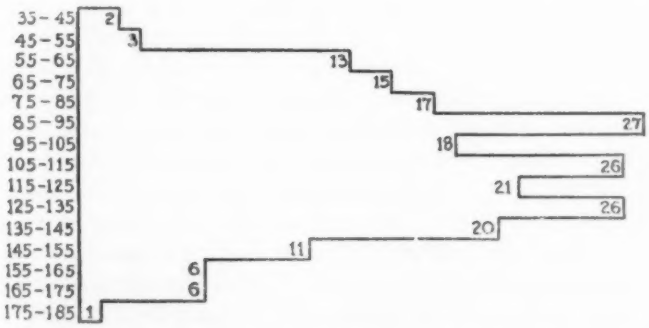
Since the publication of the Rockefeller Foundation Report on the whole field of nursing education in this country, less may be said in future by an uninformed press and public on the "over training" and over education of the student nurse, as it is agreed by the Foundation "that the standards are none too high for the important and responsible work nurses are doing." "In the public interest, these standards should be maintained and strengthened.

Concerning an analysis of the student nurse groups tested in this study, as superintendents of training schools for nurses, in common with many of us, have a conservative attitude toward the new and to them unknown, it was necessary in gaining permission to give a psychological test to a group of their students, to accept with alacrity the groups offered by them. In two instances probationers only were suggested as subjects and gladly accepted; though one had hoped to be given students who had been longer in the training schools, in order to be assured of that "intimacy of acquaintance," when the personality and character blanks were filled out. The size of the group was also a matter of the convenience and wishes of the superintendents, and so the seven groups offered here vary in number from twenty-four to thirty-nine.

To ascertain the general intelligence of the students, the Army Alpha Group Intelligence Test was chosen, Form 9, and given to the seven groups in the usual way. The testing was done on Alpha in February and March of 1922. This test has since become so well known in the population at large that

there is some reason to believe that it may not be as reliable as it was formerly considered. At all events in later work with Alpha, some testers tend to get an undue proportion of high scores with nursing groups.

The test blanks were corrected and graded from A to D in the manner used in the Army, the letter grades being later transposed into numbers from 1 to 7. The results of this testing are highly gratifying and make an even more favorable showing than the tests of army nurses reported on page 829 of Volume 15 of the "Memoirs of the National Academy of Science" on "Psychological Examining in the United States Army." In the list of occupations on that page the middle fifty per cent of army nurses ranked next to the highest in the C plus group. The median for this group falls at 25 per cent below the lowest B grade. In the present study the median of 110, falls slightly above the lowest B score. It is to be expected that the group under discussion in this paper would test somewhat higher. A graph is given here for the group



GRAPH OF ARMY ALPHA SCORES MADE BY STUDENT NURSES IN SCHOOLS OF NURSING IN NEW YORK CITY

tested as a whole. It would indicate the desirability of a more rigorous exclusion at the lower end of the scale in order that the individual groups may be more homogeneous, particularly for teaching purposes. One might well consider eliminating

those making an Alpha grade of below 75, provided of course, that the results in this test were corroborated by other objective, and subjective measures as reliable. Thus some of the difficulties in the training and curriculum might be simplified.

A few statistical figures follow on the results of the intelligence testing aspect of the study:

mean	113.3 (N = 212)	Median	110 (N = 212)
S.D.	29.8	$P.E._{median}$	1.75
$P.E._{mean}$	1.37	Q	22.94
$P.E._{s.d.}$	.98	$P.E._{Q}$	1.09
		Q^1	86.53
		Q^3	132.41

The present study of the intelligence of a small group of student nurses raises an interesting question as to the general level of intelligence found among student nurses in the training schools of the country.[1] Little has been done upon the testing of these young women; here and there an up-to-date superintendent of nurses is awakening to the idea that this is a tangible way of finding out something she very much wants to know; but for the most part the old fashioned and expensive "trial and error" method prevails. This usually means three to six months probationary nursing of the sick in the hospital wards, and of class instruction in both theoretical and practical work; except in the few better hospitals where the so-called preliminary course has been instituted. This course consists of a limited number of hours spent upon the wards with more or less cramming of theoretical and practical instruction, which the young nurse badly needs to prepare her for the more intelligent care of her patients. This might be considered an even more expensive method, as the time and cost of this instruction is thrown away when some of the students are

[1] Since this manuscript was written the writer has tested 2450 student nurses from the Atlantic to the Pacific, in 67 hospitals, in 26 cities and 15 states. The study represents an approximate 5 per cent sampling from five types of hospitals, taken, for the most part from the concentration of nurses in the larger localities. The Otis S. A. higher examination has been used with the entire group.

discovered to be unfitted for the work. Since intelligence is so important a factor in complex habit formation as well as in education, it would seem that group intelligence tests used in the early probationary days of the students, as a routine measure, would help much in the elimination of the lower types of intelligence, thus saving time, effort and money.

The personality and character traits rated in this piece of work were investigated according to the suggestions in Professor Rugg's series of articles in the Journal of Educational Psychology for November and December 1921, and January and February 1922, entitled "Is the Rating of Human Character Possible?" The qualities contributing to the ideal trained nurse were analyzed under nine headings as follows:

1. Conscientious
2. Self controlled
3. Tactful with patients
4. Kindly spirit
5. Cheerful quiet manner
6. Pleasing voice
7. Skill in nursing procedure
8. Team work
9. Executive ability

and subjected to the criticism of a few nursing executives and supervisors. A letter rating A, B, C plus, C, C−, D, D−, according to the Alpha scale was given for each quality, these in turn being transposed into the numbers from 1 to 7 in order to get the rank correlation between this subjective estimate and the Alpha test. Three judges from each hospital were chosen to rate their own students, these judges consisting of the training school superintendent and two supervisors, one usually being the assistant superintendent, the other the instructor in nursing procedures. The judgment of the superintendent of nurses might almost be considered a composite as she tends to hear what all supervisors think of the student. The instructor is in the habit of following up the work of the student nurses on the wards. Head nurses in charge of wards were not chosen as judges because in many

cases they would not have had under them each member of the group. The minimum of three judges was secured except in the single instance of Hospital F. Unfortunately it was impractical to use the objective "scale-man" and so the subjective method of rating was adopted. An average was taken of the nine qualities and then of the opinions of the three judges. The single rating figure obtained from the nine qualities by the three judges was correlated with the grade obtained in the Army test by the familiar "rank method" using the seven individual hospital groups. These judges were highly competent to rate the students on the nine counts, nor was there "lack of acquaintance" with them except in the two probationary groups where only a two month's acquaintance existed. They had been instructed not to confer with one another, and in most instances these rating sheets were filled out by the three judges in the presence of the writer.

The results obtained have been inconclusive from either the positive or the negative standpoint. Averaging the correlations of the seven groups gives a ρ of 0.03 practically a chance correspondence. On analyzing the separate correlations which read as follows:

	ρ	N
Hospital A	−0.07	25
Hospital B	0.12	25
Hospital C	0.55	39
Hospital D	−0.23	37
Hospital E	0.21	28
Hospital F	−0.30	24
Hospital G	−0.04	34

it will be noticed that there is a wide variation in these seven groups from −0.30 to +0.55, the latter being high enough to have some significance with a P.E. of 0.07. But these figures really require interpretation and criticism, emphasizing the unreliability of the character of subjective judgments of human traits and, that the ρ's are obtained between a subjective and an objective measure. It is the subjective aspect of the study which is especially open to criticism.

In the first place, examining the personality and character ratings by the twenty-one judges as a whole, three for each group of seven, although the headings meant something very definite to this group of professional nurses, they tended not to use the entire scale from A to D−. In the second place there was a marked tendency to give a student a single letter rating for all nine qualities: in one case for instance, a judge who did use the entire scale, gave a student a single letter rating of D, for all nine qualifications and in view of the diversity of these headings this might appear to be a biased judgment. Another judge gave this same student a rating ranging from A to C, there were two A's, three B's, and four C's; while the third judge rated her B and C with one D and that, in executive ability. Obviously the ratings on this student differ too much to be reliable. The young woman as a matter of further interest made the low grade of 71 on her intelligence test, which places her in the C group and gave her a position of 32, 34 being the total number tested in this hospital. Is it possible that her mental dullness, suspected by the superindentent who rated her D in personality and character traits, over-shadowed her other qualities? To quote from Dr. Rugg "The suggestion comes insistently, however, that one of the most potent influences working against accurate estimates of character is the prevalence of just such general attitudes toward our associates and subordinates." Superintendents of large training schools for nurses often (I use this modifier advisedly) recognize and value general intelligence, for they sometimes suffer keenly from the want of it among their students. In the third place there was a marked tendency among some judges to rate very high, there were too many "A's," for instance. This may have been due to pride on the supervisor's part in the particular training school; the training school superintendents themselves were for the most part entirely free from this fault in their individual judgments of students, the supervisors more readily falling a prey to it. Lastly in a few instances the records were not complete for three judges. Some of the students were unknown to some of the judges though the judges knowing

the largest proportion of students were chosen to make the judgments.

As to criticism of the individual hospital groups the four minus quantities as well as the two low positive correlations, 0.21 and 0.12, may be questioned at several points, some of which have been mentioned in the criticisms for the whole group. In Hospital F the rating of two judges only were used, as it was necessary to discard the third rating (by a nun) because she had used a single A rating for all the students. Judge A rated them too high, in fact the record was almost worthless because of this fact. In Hospital G half of the students were unknown to Judge A and this Judge gave a single letter grade for nine qualities on those she did rate. In Hospital A, Judge B rates too high, mostly "A's," and she does not use the entire scale; only twice does she give a rating of C. Judge C tended to use a single letter rating for all qualities and Judge A gave no mark below C plus. In Hospital D, Judge A gave too many high marks; Judge B failed to rate nearly half of the group. In Hospital B, Judge A gave too many high marks. In Hospital E the group tested were probationers and the data on some of the traits was not complete. The judges as a whole tended to rate their students too high. This leaves one Hospital, C, which seems to have been fairly free from the foregoing crticisms. In this case three competent judges rated all the students on each of the nine qualities. The entire scale was used by them and only one tended to rate high, this Judge also using in many instances, a single letter grade for nine qualities. In a number of cases there is a close degree of correspondence in the rating of the three judges indicating the reliable character of their judgments.

One further point may be of interest, the discrimination of intelligence by the judges in the few cases in this study in which it was done corroborates Professor Rugg's experience in this direction. For example, a student making a grade of A with a score of 166, is estimated as having a D grade of intelligence by Judge B, the superintendent of the training school. Another, with an A grade, and a score of 141 is also rated D; a third and fourth, making A scores of 150 and 143 are rated

A and B respectively. A second superintendent and a supervisor rate four A students as follows:

STUDENT	SCORE	SUPERINTENDENT'S RATING	SUPERVISOR'S RATING
1	149	A	A
2	148	C	C
3	145	B	B
4	136	B	B

Why do both judges fail to suspect the superior intelligence of No. 2, and both recognize it in No. 1 who makes only one point higher? Here we have the "direct comparisons of judgments of a trait and the objective measurement of it in the case of intelligence." Professor Rugg says of his Army study in this connection, "Taken as a group, officers of outstanding superior intelligence discriminate intelligence in others little better than do those of "average intelligence."

CONCLUSIONS

1. That, as the measurement of intelligence used in this test has been well standardized and is fairly reliable as a group test of intelligence one feels well satisfied with the results of this objective measure.

2. That, with reference to the subjective aspect of the study, had it been practicable to return later to these twenty-one judges for re-judgment on these students, the second group of results averaged with the first would doubtless have increased the reliability of many of the judgments.

3. That, considering the criticisms made above of the four negative correlations and the two low positive ones, we should be cautious in concluding from this study at least that only a chance relationship exists between personality and character traits and intelligence, on the contrary, in spite of the findings the indications may be in the other direction.

4. That, further work along this special line would, in all probability, amply repay the effort, particularly if sufficient data were collected so that suitable selection could be made of it.

THE NEGRO CHILD'S INDEX OF MORE SOCIAL PARTICIPATION

HARVEY C. LEHMAN AND PAUL A. WITTY

The University of Kansas

Numerous investigations have yielded results which show rather conclusively that negro children do less well than white children in tasks which involve abstract intelligence (1). Peterson has suggested that certain traits worthy of note may be stronger in negro than in white children. Peterson (2) mentions specifically "freedom from tension" and "ease of bearing in social situations:"

> In a positive way the negro probably has certain traits worthy of note which are stronger than those in the white man. These have unfortunately not received as much attention as the deficiencies. It is probable that the negro has greater freedom from tension and from concern about remote conditions with an ease of bearing in social situations that is due to something more than a lack of realization of remote relations.

Lack of an adequate technique heretofore has militated against objective measurement of the traits mentioned by Peterson. Too, there have been many speculations and few objective measurements of racial differences in other traits of character. Pintner (3) cautiously refrains from speculating about racial differences in social or emotional traits:

> While we cannot conclude dogmatically that there are no qualitative differences between the two races, we may at least say that any marked qualitative difference in intelligence, as measured by the tests under consideration, does not seem to exist. In saying this we must remember that we are restricting ourselves entirely to the type of intelligence which is tested most effectively by the Binet and customary group tests. Mechanical intelligence has been much less effectively measured and social intelligence practically not at all. Furthermore we must remember that we have not raised the question as to emotional and moral differences between the two races. Popular opinion assumes large

differences in these traits. There are no scientific measures of these as yet, and speculation about possible differences in this regard does not belong in a book devoted to intelligence testing.

The inferiority of the negro in tasks involving abstract intelligence has been demonstrated by various workers in quantitative psychology. It must be remembered that the tests used in most cases have been the group or individual intelligence examinations in which reading or language mastery plays an important part. There is some evidence that negro children fall below the standing of white children in mental ability when the task employed is of the performance type and the language handicap is partially eliminated.

Hollingworth (4) asks, "What does quantitative psychology teach with respect to the combination of performances in a given personality?" She concludes, "It will be seen that there is no law of compensation in human ability, however much we may long to find it there."

Again Hollingworth (5) states:

There is found to be a quality of the individual which results in generally superior, mediocre, or inferior performance in his case . . . . a *positive coherence in the amounts of all traits possessed* extending even to appreciable coherence between physical and mental.

Decision in reference to compensation or correlation of desirable traits must be reserved until definitions of "desirable" and "undesirable" have been formulated and agreed upon.

Popular opinion assumes that a given trait is either desirable or undesirable. It may be that the degree to which an individual manifests a given trait is the best criterion of the desirability of that trait. Practical observation seems to indicate that moderation is desirable in most activities. For example, over-cautiousness may prove as undesirable as undercautiousness. Sociability is often assumed to be a desirable trait. Common sense would seem to support the following proposition (6):

It is necessary for a child to mingle with other children in order to learn how to get along with other people, but a child also has a right to

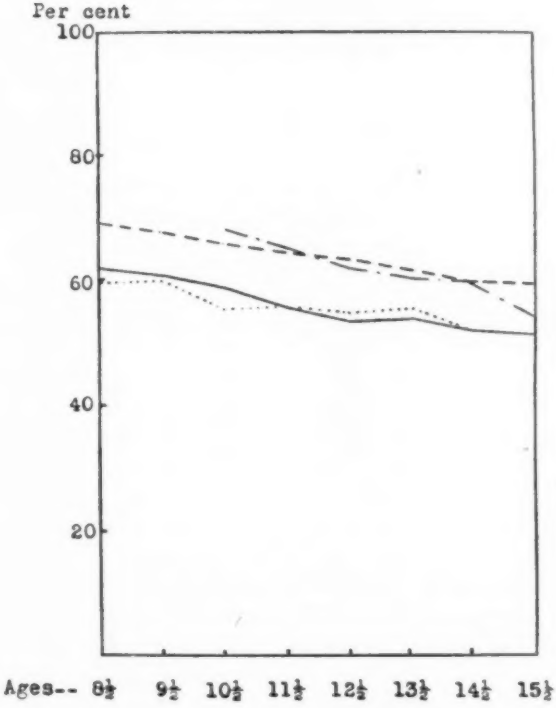
be alone a part of the time so that his individuality may have a chance to develop.

Lack of an adequate technique heretofore has militated against measurement of the extent to which a given child mingles with other children. Obviously there is need to account for the child's social contacts. Deviation from normal in respect to social participation will be intelligible to the student of education only when it is measured quantitatively. Qualitative expression of deviation is no longer satisfactory. The writers have attempted to state quantitatively the extent to which white and negro children differ in social participation. The following paper reports a study of the extent to which white children and negro children respectively participate with other children in their play activities.

METHOD

The Lehman Play Quiz was administered to more than 6,000 children in grades III to XII in the public schools of Kansas City, Missouri. The Play Quiz is devised for children in grades III to XII. The children are asked to indicate among a comprehensive and catholic list of 200 activities *only those* in which they have engaged *during the preceding week*. The children are later asked to designate the activities in which they participated *alone*. These activities in which children engage without companionship will be designated solitary activities when alluded to in the discussion following.

Included in the study were pupils from the following schools: Benton, Faxon, Franklin, Horace Mann, Humbolt, S. B. Ladd, Central Junior High, Northeast Senior High, Attucks, W. W. Yates, and Wendel Phillips. The last three schools of the preceding list are attended by negro children only. In order that environmental differences might also be taken into account the Quiz was administered to the pupils of certain one-teacher, rural schools in Douglass, Franklin, and Shawnee counties (Kansas). Small rural schools were selected for the study in order that a genuinely rural environment might be obtained for the study. The rural schools were attended by white children



MEAN INDICES OF SOCIAL PARTICIPATION FOR FOUR GROUPS OF CHILDREN

Negro children, Tulsa, Oklahoma.....
Negro children, Kansas City, Missouri.....

White children, Kansas City, Missouri.....
White children, (Kansas rural).....

only. The number of children of each group for each age-level from 8½ to 15½ inclusive may be seen by reference to table 1.[1]

[1] The Tulsa children included in table 1 were given the Play Quiz by Mrs. Thelma Hill Anderson, a graduate student of The School of Education of The University of Kansas. Mrs. Anderson administered the Play Quiz to Tulsa pupils in order to procure data for a Master's thesis. Acknowledgement is herewith made for the use of these data.

For each child the total number of play activities engaged in during the preceding week was ascertained. The number par-

TABLE 1

Number of children included in the present study

CHRONOLOGICAL AGE	RURAL WHITE CHILDREN	KANSAS CITY, MO., WHITE CHILDREN	KANSAS CITY, MO., NEGRO CHILDREN	TULSA, OKLA., NEGRO CHILDREN	TOTAL CHILDREN
8½	75	356	108		539
9½	94	543	173		810
10½	120	574	201	24	919
11½	129	608	226	49	992
12½	148	706	196	65	1,115
13½	128	758	156	87	1,129
14½	86	672	95	112	965
15½		747	55	109	911
16½				72	72
17½				25	25
Grand total					7,477

TABLE 2

Mean indices of social participation for each of four groups of children

CHRONOLOGICAL AGE	NEGRO CHILDREN, TULSA, OKLA.	NEGRO CHILDREN, KANSAS CITY, MO.	WHITE CHILDREN, KANSAS CITY, MO.	WHITE CHILDREN, RURAL (KANSAS)
8½	*	68.4	61.8	59.3
9½	*	67.4	60.6	59.9
10½	68.3	65.5	58.9	55.1
11½	65.3	64.5	56.1	55.9
12½	62.4	63.0	53.7	54.4
13½	60.5	61.9	54.4	55.5
14½	60.2	59.0	52.1	52.5
15½	54.8	59.5	51.4	*

* Data lacking.

ticipated in with one or more additional children was next determined. The per cent of the total activities that the social activities represented was designated the index of social partici-

pation. Thus, an index of social participation of 80 indicates that 80 per cent of the activities engaged in by the child were ones in which one or more additional children also took part. By this method of reckoning a high index of social participation signifies that the child is relatively social in his play behavior. Conversely, a low index of social participation means that the child is relatively solitary in his play.

TABLE 3

Percentages of negro children whose indices of social participation reach or exceed the medians of white children at each age-level

CHRONOLOGICAL AGE							
8½	9½	10½	11½	12½	13½	14½	15½
68%	63%	61%	67%	68%	63%	65%	64%

RESULTS

Table 2, shows the mean index of social participation for the four groups of children. It will be noted from table 2, that the negro children are distinctly more social in their play than either of the white groups.

Table 3, shows the percentages of negro children whose indices of social participation reach or exceed the median of the white children of corresponding C.A.'s. In table 3, comparison is made of two groups only, namely, the negro children of Kansas City, Missouri, are compared with white children of the same city.

Particularly salient is the fact that in every age interval ($8\frac{1}{2}$ to $15\frac{1}{4}$) negro children are more social in their play than white children. The differences are *marked and consistent* from year to year. From the data it is apparent that a conspicuous difference exists between the races in social participation.

REMARKS

Speculation regarding these data is interesting. There appears to be no means of ascertaining whether the extreme so-

ciability of the negro child is a cause or a result of other racial characteristics. How much social participation is consonant with well-balanced development is unknown. It is entirely possible that over-participation in social activities may result in neglect of certain individual activities essential to well-balanced development. It is therefore impossible to say whether the negro child's excessive sociability is a handicap or an asset.

In a previous study the writers showed that children of low progress quotients are considerably more social in their play behavior than are children who make normal progress in school (7). It was pointed out also that gifted children (I.Q. 140 or above) are less social than are unselected children (8). In an unpublished master's thesis in which a study was made of two groups of negro children, one group consisting of children having high indices of social participation, the other consisting of children having very low indices of social participation, it was found that the more solitary group was much superior to the extremely social group in scholarship (9).

These data indicate that an excessively high index of social participation is likely to coexist with inferior scholarship. Whether much social participation posits also "freedom from tension" and "ease of bearing in social situations" are matters of speculation.

REFERENCES

(1) PINTER, RUDOLPH: Intelligence Testing. 1923. Henry Holt and Co. Chap. X, pp. 337–348.

(2) PETERSON, JOSEPH: The comparative abilities of white and negro children. Comparative Psychology Monographs, Vol. I, Serial No. 5, July, 1923, p. 137f.

(3) PINTNER: Ibid., p. 345.

(4) HOLLINGWORTH, LETA S.: Special Talents and Defects. 1923. New York, The MacMillan Co. p. 9.

(5) HOLLINGWORTH: Ibid., p. 33f.

(6) SWAN, EDITH: A mother's view of the twelve-month-school plan. The Elementary School Journal, February, 1926, p. 429.

(7) LEHMAN, HARVEY C., AND WITTY, PAUL A.: A study of play in relation to school progress. The Educational Review (Forthcoming article).

(8) WITTY, PAUL A., AND LEHMAN, HARVEY C.: The play behavior of fifty gifted children. Journal of Educational Psychology (Forthcoming article).

(9) ANDERSON, THELMA HILL: A comparison of groups of negro children having high and low indices of social participation respectively. Unpublished Master's Thesis on file in Watson Library. The University of Kansas. 1926.

MENTAL DIFFERENCES IN CHILDREN REFERRED TO A PSYCHOLOGICAL CLINIC

MAUD A. MERRILL

Stanford University

The problems confronting a psychological clinic are, for the most part, of a very practical nature demanding immediate attention and at least some gesture of solution. How intimately the clinician is concerned with the people of Moronia can never be guessed from a statistical table! Yet from events of such psychological significance as Mr. Guerrero's earnest attempt to provide for a family of fourteen by turning from casual labor to the more lucrative establishment of a mission at his home, the psychologist must turn to take account of her group of Guerreros and Canonzzaros and their like.

It is a group made up very largely of South Europeans who have drifted to California from Italy and Portugal, some by way of the Azores, and have been making their living by seasonal labor in the prune and apricot orchards of the Santa Clara Valley. The Psychological Clinic of the Santa Clara County Health Center, established as part of the Stanford University Psychological Clinic,[1] offers psychological analysis of individual cases followed by a plan of treatment based upon such clinical findings. The children referred to the clinic include some presenting behavior problems in school, some who have come to the attention of local physicians, and some who have been brought before the court for commitment to institutions. Parents, too, have learned to bring their children to the clinic for advice on mental hygiene.

[1] The writer has for a number of years conducted another clinic in connection with the Juvenile Court of Santa Clara County. A report of the mental characteristics of this group appeared in Vol. x, 2, of the Journal of Delinquency, March, 1926.

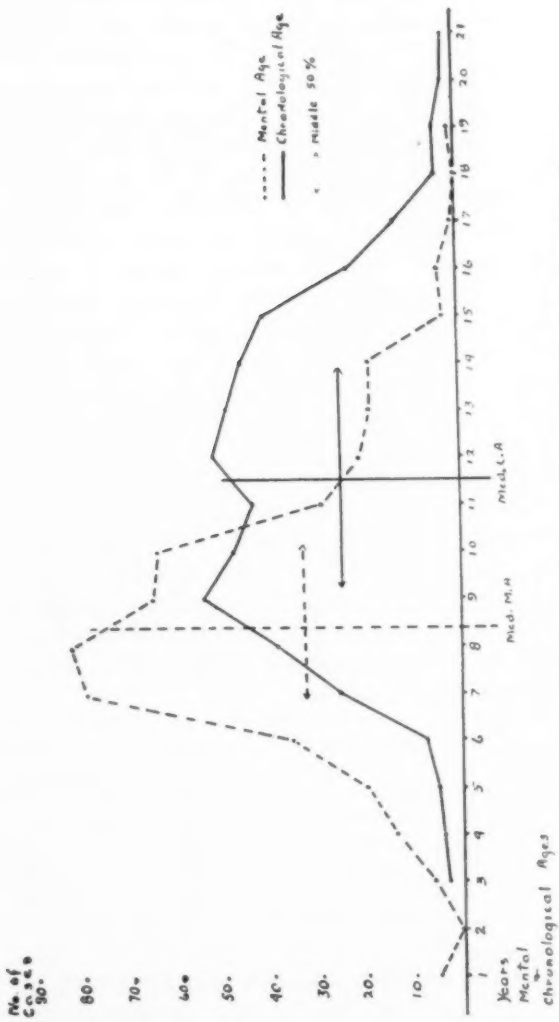


FIG. 1. DISTRIBUTION OF CLINIC CASES BY MENTAL AND CHRONOLOGICAL AGES

The Health Center has a social worker who serves the mental clinic by getting family and social history data and by a certain amount of follow-up work. The psychologist, a member of the Stanford University faculty, holds clinic one day a week at the County Health Center. The psychologist is assisted by qualified graduate students from the Stanford psychology department. Without the services of the social worker, the psychological work would be clinically futile. The social service department bears about the same relation to the psychological clinic that the effector system of muscles and glands bears to the central nervous system of the body.

The cases referred to the Psychological Clinic range in age from 3 to 21 years while the mental age scores range from 1 to 19 years. In intelligence quotient the range is from 10 to 130. The typical child referred to the Clinic is about eleven and half years of age and has the mental development of a child of eight. (Median chronological age is 11.6 and the median mental age 8.4.) The middle 50 per cent of the cases fall between ages 9.3 and 13.9 with mental ages between 6.9 and 10.2. The median I.Q. of the group is 77.1 with the interquartile range falling between 64.8 and 91.6. These distributions, shown in figure 1, serve to delimit the group with respect to mental level. The following classification[2] according to mental status shows:

I.Q.	CLASSIFICATION	NUMBER	PER CENT
10–24	Idiot	6	1.3
25–49	Imbecile	33	7.1
50–69	Moron	118	25.3
70–89	Retarded	180	38.6
90–109	Average	101	21.5
110–130	Superior	29	6.2

In a group of unselected children only the lowest 2 per cent fall as low as the lowest 34 per cent of the clinic group and the

[2] It will, of course, be understood that such a classification is purely arbitrary and is made only for convenience in grouping. Mental diagnosis is never made on such a basis.

range designated as average, that between 90 and 110, includes only 21.5 per cent of the clinic cases.

NATIONALITY AND MENTAL LEVEL

Our children are mostly Latins whose parents have come from the South of Europe. By "Latins" we shall mean the South Italians, Portuguese, and Spanish-Mexicans. These

FIG. 2. PERCENTAGE DISTRIBUTION OF CLINIC CASES BY NATIONALITIES

	Per cent
Italian	38.2
American	37.9
Portuguese	7.4
Mexican	4.5
Spanish	3.9
British	3.6
Scandinavian	2.2
Slavic	1.3
German	1.0

Latins constitute 9.3 per cent of the population of Santa Clara County but they make up 54.0 per cent of the admissions to the Psychological Clinic. Twenty-one per cent of the population of the County is made up of foreign-born whites. Of these foreign-born whites, 29.2 per cent are Italians. Italians constitute 6.2 per cent of the total population of the County but 38.2 per cent of the Clinic admissions are Italians and 61.4

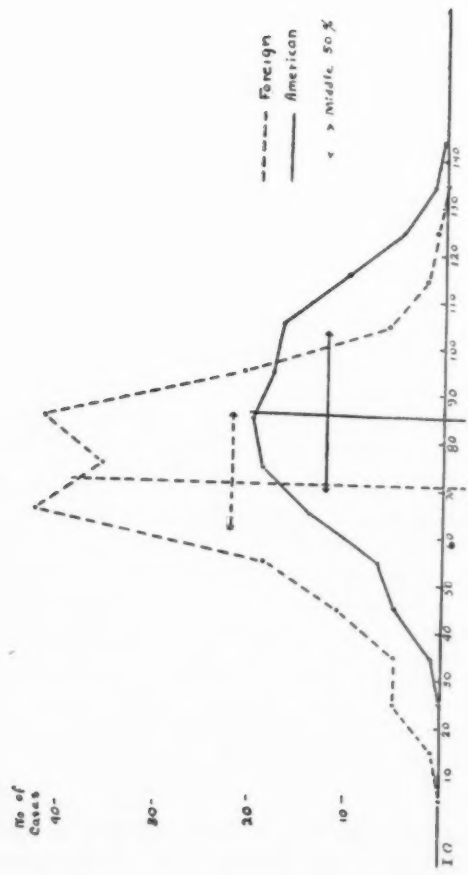


FIG. 3. DISTRIBUTION BY I. Q. OF FOREIGN AND AMERICAN GROUPS

per cent of the foreign-born parents of Clinic children are Italians. (These figures are based on a total population of 467 cases who have been given mental examinations.) Children have been classified according to the birth-place of parents. All but a negligible number of the children are American-born. Our "American" group includes many cases of South European stock only one generation removed from ancestors who knew no English and whose American-born parents, living in a "little Italy" in this country, are more familiar with Italian speech and ways than with those of their adopted country.

The median intelligence quotient of the group whose parents are American-born is 86.1 (P.E. 1.9) while that of the foreign-born is 71.7 (P.E. 1.1). The range of intelligence quotients of the American group is 33 to 130 while that of the foreign group is 17 to 122. The middle 50 per cent of the American group is between I.Q. 70.4 and 103.4; the middle 50 per cent of the foreign group is between I.Q. 61.3 and 86.3. Figure 2 shows these distributions for both American and foreign groups.

The mental inferiority of the foreign-born group and especially of the Italian group is outstanding.[3] That this inferiority is not due to a language handicap that causes this group to show such a marked retardation as measured by psychological tests seems clear from an analysis of the evidence. A similar group was examined by Dr. Kimball Young[4] with a view to the determination of the mental level of Latin immigrants in Santa Clara County. Dr. Young used, besides the verbal tests, other tests non-verbal in character designed to eliminate the language factor. He presents conclusive evidence to the effect that the inferiority revealed by the verbal tests is revealed equally clearly by the non-verbal tests. Dr.

[3] It should be understood that the Latin population of Santa Clara County, especially the Italian and Portuguese, is not representative of the general level of intelligence of those nationalities found in the home country or in other sections of the United States.

[4] Kimball Young, Mental Differences in Certain Immigrant Groups. Univ. of Oregon Pub., I–II, July 1922.

Young concludes: "That the alleged language handicap does not in fact exist in the case of children of South European descent, to the great extent imagined. It serves as a handicap chiefly for those newly arrived in this country, but of these, those who have the capacity do acquire the tools rapidly and those who have not the capacity remain on a lower level of ability. That the true difficulty is one of mental capacity, or general intelligence, which makes the Latins unable to compete

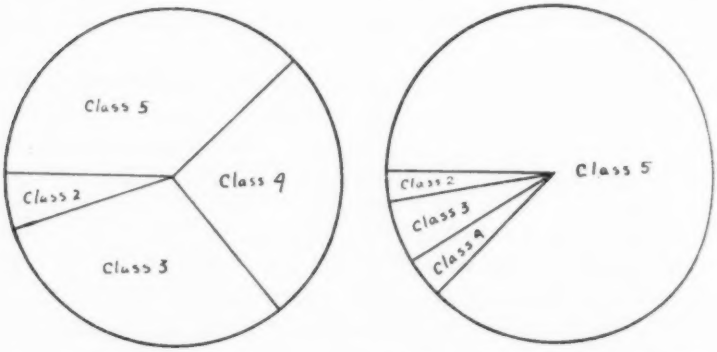


FIG. 4. PERCENTAGE DISTRIBUTION OF OCCUPATIONAL RATINGS ACCORDING TO TAUSSIG CLASSIFICATION

	AMERICAN *per cent*	ITALIAN *per cent*
Class 5	37.7	87.5
Class 4	26.4	3.9
Class 3	33.0	5.8
Class 2	2.8	2.9

with children of North European ancestry. . . . ." Dr. Young states also that "If it be thought that the average I.Q. of the American group in its modal grade be 100, then the average I.Q. for the Latins would be near 83."

If we examine the Clinic cases with this relationship in mind we find that the average I.Q. of the American group bears the same relationship to the average I.Q. of unselected American children (I.Q. 100) that the average I.Q. of the foreign-group bears to the average I.Q. which Dr. Young found for his group

of unselected foreign cases in Santa Clara County, i.e. 100:83::86:72. That is to say the American group of Clinic

TABLE 1

Distribution of I.Q.'s by nationality of parents

I.Q.	AMERICAN	ITALIAN	MEXICAN	PORTUGUESE	SPANISH	SCANDINAVIAN	BRITISH	SLAVIC	GERMAN	FOREIGN TOTAL
15–19									1	1
20–24				1						1
25–29		3	1							4
30–34	1			1	1					2
35–39		1					2			3
40–44	4	2		1		1				4
45–49	1	4	1	2						7
50–54	1	5	1	2		1				9
55–59	6	6		3	1					10
60–64	4	7	1	3	2		1		1	15
65–69	10	17	3	1	3	2	1	1		28
70–74	8	16		2	2		2			22
75–79	11	8	1	4		1				14
80–84	7	15		1		2				18
85–89	13	17	3	1	1		1	1		24
90–94	9	10	1		2					13
95–99	9	4	1	1			1	1		8
100–104	6	1						1		2
105–109	11	1	1				2			4
110–114	7									0
115–119	4	1							1	2
120–124	4						1			1
125–129										0
130–134	1									0
Total.....	117	118	14	23	12	7	11	4	3	192
Median.....	86.1	73.4	72.0	61.8	67.3	67.8	72.8			71.7

cases is as much retarded with reference to the 100 I.Q. standard as the foreign group is with reference to the 83 I.Q. standard which was found to be the level of unselected Santa Clara

County children of Latin parentage. Table 1 shows the distribution of I.Q.'s by nationality of parents.

In a further attempt to analyse the data with regard to the mental status of the foreign group, a comparison was made between the I.Q.'s of older and younger children in the same family in the case of both American and foreign children. If the older foreign children proved to have higher I.Q.'s than younger children in the same family it might seem to indicate that further exposure to their educational environment was operating as a causal factor. In the American group 39 comparisons were possible between older and younger children in the same family; in the foreign-group 60 comparisons. (It will be recalled, of course, that the foreign group is made up of children of foreign-born parents; the children themselves were born in this country.) In the case of the American group the central tendency of change from younger to older children in the same family was 1.15 points decrease in I.Q. which means that the younger children in the family tended to have slightly higher I.Q.'s. In the foreign-born group the central tendency of change was 4.68 points decrease. The middle 50 per cent of change is between 3.78 points increase and 18.33 decrease. This tendency cannot be explained on the assumption that the older children were not adequately measured by the scale, since the group is so retarded that it does not touch the upper end of the scale. Whatever the reason for this decrease in the foreign group at least it is perfectly clear that the I.Q. is not being increased in the case of the older children because of their longer contact with American schools. It is therefore highly probable that the mental retardation of the group is not due to a language handicap but to the innate mental inferiority of the group.

Table 2 shows the relationship between the number of children in a family and nationality. The figures indicate the number of families of each nationality having 1, 2, 3, etc., children. For 70 American families represented in the Clinic group the average number of children was 3.7 per family. Italians average 5.2 children per family and the Portuguese

the largest number 6.0. There are, however, only 11 families represented in the Portuguese group and the average is brought up by one family with 12 children. The average number of children for Clinic families is 4.8. Of course, this figure is much too high for average families of the several nationalities in the community, because the Clinic families are selected in the first place by the fact of having children to be brought to a clinic. Then, too, the larger the family the more apt the

TABLE 2

Relationship between number of children in a family and nationality

NUMBER OF CHILDREN	AMERICAN	ITALIAN	PORTUGUESE	MEXICAN	ALL OTHERS	TOTAL
1	9	3	2			14
2	15	4	1	1		21
3	10	10	1	1	5	27
4	7	8			3	18
5	7	12	1	1	4	25
6	11	11	2	4	6	34
7	8	8	1		3	20
8	2	5	1		1	9
9	1	2	1			4
10		1				1
11		2				2
12			1			1
Total.....	70	66	11	7	22	176
Median...	3.7	5.2	6.0	5.6	5.3	4.8

family is to need assistance and thus to come to the attention of the Health Center. On the other hand, since the age of parents has not been taken into account we are not sure that these families represent fairly the size of Clinic families, because there is no evidence that the family is completed. The figures must be taken only at their face value as representing the present status of size of family for each nationality that is being served by the Psychological Clinic.

THE SOCIAL-ECONOMIC STATUS

Since the Health Center admissions are made on the basis of the budget plan suggested by Professor Jaffa of the University of California, an objective criterion of economic status is available in the classifications made according to this plan. The Jaffa Budget is based on "the average of many dietary studies of families of small income and has been modified just enough to overcome undesirable deficiencies due to enforced privations and to meet the minimum demands for health and efficiency." For the purposes of the present study the budget is cited merely as an objective criterion of the economic status of the group. Its standard is the minimum of subsistence diet required and is a combination of the "theoretically worked out standard and that which is the people's instinctive choice modified by tradition, built up by generations of experience and limited by small income."[5]

The budget, modified from the Jaffa Budget, which is used as a basis for Clinic admissions is as follows:

Class E is not eligible.
Class D pays 50¢ a treatment and pays costs for drugs etc.
Class C pays 25¢ a treatment and pays ¾ of the cost of drugs.
Class B pays 10¢ a treatment and pays ¼ of the cost of drugs.
Class A pays nothing for treatment and nothing for drugs.

Monthly Income

	CLASS E	CLASS D	CLASS C	CLASS B	CLASS A
For:					
Man	Over 75	65–75	55–65	45–55	Under 45
Woman	Over 70	60–70	50–60	40–50	Under 40
Man, Woman, Baby	Over 120	110–120	90–110	80–90	Under 80
Man, Woman, 3 children	Over 150	140–150	130–140	120–130	Under 120
Man, Woman, 5 children	Over 190	180–190	170–180	160–170	Under 160

[5] In discussing its limitations, the maker of the budget quotes the suggestion of Professor Miller of Harvard that statisticians who get to Heaven be put to the task of determining how much milk and honey are

The occupation of parents was also considered as an index of social and economic status. Occupations have been grouped according to the Taussig classification. Taussig outlines five classes of vocations, chiefly on the basis of economic standing. Class V includes the unskilled day laborers; IV, the semi-skilled; III, the "aristocracy of the manual laboring class," the skilled workmen, II, the lower middle class ("the white-collared working class"); "here are clerks, bookkeepers, salesmen, small tradesmen, foremen, teachers of the lower grades," etc.; Class I, "the professionals, the business men, managers of industry, higher public officials, and the smaller propertied classes generally."

According to the Jaffa Budget classification no significant difference has been found between average I.Q.'s of children whose parents fall into Class A, B, C, or D. The median I.Q. for Class A is 72.7 with the middle 50 per cent of the cases between 51.9 and 94.1; the median I.Q. for Class B is 73.1 with the middle 50 per cent of the cases between 51.9 and 93.6; the median I.Q. for Class C is 72.9 with the middle 50 per cent of the cases between 52.5 and 93.7. Class D has not been considered because there are too few cases to make the averages of any significance. (Three cases fall into Class D.) But divide the groups into American and foreign and there appears to be a significant difference. For the American group the medians and middle 50 per cent are as follows:

	MED. I.Q.	P.E.	Q_1	Q_3	D	$P.E._d$	RATIO
Class A.....	85.3	2.5	69.9	99.4	6.7 (A & B)	4.1	1.6
Class B.....	78.6	3.2	68.4	100.4	9.3 (A & C)	3.7	2.5
Class C.....	94.5	8.6	59.6	117.8			

necessary to maintain an adult saint for ten thousand years. In the same vein of sardonic humor he might have suggested—perhaps after reading some text book on statistics—that such statisticians as do not get to Heaven be set the task of computing a minimum standard "for health and efficiency" for the people of Moronia who don't know how many pencils you can buy for fifty cents when two pencils cost five cents. For it is the people of Moronia who constitute the real problem of the Clinic.

Class B is inferior to Class A in mental status and Class C is superior to Class A in mental status. For the foreign group the differences are as follows:

	MED. I.Q.	P.E.	Q_1	Q_3	D	$P.E._d$	RATIO
Class A.....	69.6	1.7	59.3	83.2	4.9 (A & B)	2.3	2.1
Class B.....	74.4	1.6	64.5	87.4	1.7 (B & C)	2.8	0.6
Class C.....	72.8	2.3	64.3	85.2			

Here the difference between Class A and Class B is large enough to be significant but that between Class B and Class C is not a significant one.

It is clear that whatever differences there are between the Class A, Class B, and Class C groups are obscured by throwing the cases altogether without taking account of the nationality differences. The Americans in the Class C group are clearly of superior mental status and probably in need of temporary relief only. Analysis of the data shows this to be the situation in the majority of cases. It is not apparent why Class B should prove to be inferior in intelligence to Class A unless the explanation lies in the fact that widows are given this classification by virtue of the fact that they are widows, and deprived of a provider, whatever their economic standing within the range of the levels served by the Health Center. In the foreign group Class A is differentiated from the other two which are not significantly different from each other. Here Class A seems to include individuals of lower intellectual and, consequently, of lower economic standing.

Is there any relation between the intelligence of the children and the present occupational groupings of the parents? When grouped according to the Taussig classification a rough relationship seems to hold. By nationalities the percentages in each class are shown on page 483.

Here the Italians again appear to be inferior in occupational rating as well as in intelligence. The graphs show these percentages for both the Italian and American groups. Median

TAUSSIG	CLASS V	CLASS IV	CLASS III	CLASS II	TOTAL NUMBER OF CASES
American	37.7	26.4	33.0	2.8	106
Italian	87.5	3.9	5.8	2.9	103
Portuguese	73.3	6.7	20.0		15
Mexican	100.0				14
Spanish	100.0				12
Scandinavian	14.3		85.7		7
British	22.2	11.1	66.7		9
Jugo-Slavic	50.0		25.0	25.0	4
German	50.0	50.0			2

scores for each of the five classes show a distinct increase from lower to higher occupational ratings; Class V, I.Q. 71.8; Class IV, I.Q. 80.9; Class III, I.Q. 86.0. The number of cases in Class II is too few to be significant. There is a small positive correlation between I.Q. and Taussig classification ($r = 0.26$).

Young found, in the study mentioned above, that "the mean intelligence scores of the children whose parents were classified indicate that there is a rough relation between occupational status of the parents and the general intelligence of their offspring in the public schools. The mental tests show some correlations with the occupational ratings. If not large, these are at least indicative of a certain disposition of the occupational level to reflect the general ability of the families."

EDUCATIONAL LEVEL

Educationally the children, because they are older chronologically, have been pushed beyond the level of their intellectual capacity. We find the mentally retarded cases of our group advanced according to grade placement when the mental age is taken as the index of grade level at which the child will probably be able to function. Table 3 shows the relation of mental age to grade. Numbers to the left of the enclosed frequencies in this table indicate that the cases are retarded for their *mental age*, frequencies to the right of the cells indicate that cases are advanced for their *mental age*. For example,

there are 48 cases with a mental age of 9. Of these 5 are retarded because they are only in the second grade, 13 are properly placed in the third grade according to their mental age, 13 are advanced one year for their mental age, 10 are advanced two years, 2 are advanced three years, and 5 mental nine-years-olds are trying to do the work of the 7th grade. The median mental age of the group is 8.7, but the median grade is between 3 and

TABLE 3

M.A.*	GRADE											
	1	2	3	4	5	6	7	8	9	10	11	Total
19											1	1
18												0
17							1					1
16					1			1		1		3
15					1			1				2
14					1	3	2	1	1	1		9
13					1	3	3	1	1			9
12					7	2	1	2	2			14
11			1	2	4	7	1	2				17
10		2	12	9	9	11	4					47
9		5	13	13	10	2	5					48
8	3	15	24	12	3							57
7	11	21	13	1	1							47
6	13	3	2	1								19
5	5	3										8
4	1											1
Total.....	33	49	65	38	38	28	17	8	4	2	1	283

* Mental Age 5 means 4–6 to 5–5.

4 (3.4). Of the total number of cases 59 or 20.8 per cent are properly placed according to their mental age; 48 or 17 per cent are retarded; and 176 or 62.2 per cent are advanced, that is they are trying to do work which is beyond their mental capacity. It is, of course, not to be expected that there will be a perfect correlation between mental age and grade placement. Other and different mental factors besides intelligence

enter into school success, such factors as conscientiousness, ability to fit into the social group, traits of personality and the like that make for social adjustment. But give a child or an adult tasks that are beyond his ability, confront him continually with social situations with which he is unable to cope, and sooner or later you will find him categorized somewhere in school, in the court, at your social agency, or at your clinic a "behavior problem." Mental inferiority is, in a large per cent of our cases, the original cause of the maladjustment.

CIVIL STATUS OF PARENTS

In order to determine how many of our cases came from broken homes, I have classified our children according to the civil status of parents. For the 316 cases for whom these data were available, I have found that 211 or 66.7 per cent of the cases came from homes where both parents are living. Here poverty and a low level of intelligence seem to have been the determining factors in the situation. Thirty-seven or 11.7 per cent have come from homes broken by the death of the father. In 18 cases, 5.7 per cent, the parents are separated. In 17 cases, 5.4 per cent, the mother is dead. Fourteen cases, 4.4 per cent, come from homes broken by reason of divorce. In 8 cases, 2.5 per cent, both mother and father are dead. In 7 cases, 2.2 per cent, the father has deserted the family. In 4 cases, 1.3 per cent, the mother has deserted.

SUMMARY

Of 467 cases referred to the Psychological Clinic of the Santa Clara County Health Center, 157 or 33.7 per cent fall below I.Q. 70, 180 or 38.6 per cent are mentally retarded, 101 or 21.5 per cent average, while only 29, 6.2 per cent, attain a mental level above I.Q. 110. The foreign group is more retarded than the American group and this inferiority seems to be due to native endowment rather than to inability to handle the language. Of the foreign group the Italians constitute the largest per cent; in proportion to the number of Italians in the county they exceed their quota of the Clinic group by

about 30 per cent. In social and economic status as indicated by the Taussig classification into non-competing groups and the Jaffa Budget classification, the American and foreign groups each show a slight tendency towards positive correlation between economic status and intelligence. In general the lower the economic status the lower the level of intelligence. Educationally the group is retarded with respect to chronological age and advanced with respect to mental age. The retarded children of the group have been pushed beyond their mental capacity.

INTEREST AS AN INDICATION OF ABILITY

RICHARD S. UHRBROCK
University of Wyoming

A. INTRODUCTION

The possibility of the existence of a close relationship between interest and ability has stimulated a significant line of research during the past few years. If interest in "things," for example, is an indication of ability to work with things, the fact is of immense importance to the educational and vocational counsellor, and to the employment manager. The first aim of this investigation was to determine, for a group of college men, the relative proportions interested in (*a*) things, (*b*) people, and (*c*) ideas. The second aim was to discover, if possible, whether interest may be considered as an indication of ability.

The investigations within this field have been of four main types: (*a*), those dealing with interest and ability so far as school subjects are concerned, (*b*), those dealing with interest in *specific occupations* and ability as indicated by intelligence test scores, (*c*), those dealing with interest as a basis for rough vocational classification in order to determine, for example, whether a technical school graduate should choose sales or design engineering. In the fourth type of study, (*d*), an attempt has been made to classify interests into types, e.g., *humanics* or interest in people, and *mechanics* or interest in working with things. The neglected classification, interest in working with ideas, as exemplified by certain types of authorship, scientific research and invention, is considered in this paper.

B. REPRESENTATIVE STUDIES

The main points developed by these four types of investigations may be reviewed with profit. Thorndike reported in

1912 upon the problem of the permanence of interests and their relation to abilities. This original study, based upon 100 cases, was extended so that in 1917 a report on 344 cases was made. In each investigation the subjects estimated their order of interest, and order of ability, in the following subjects: mathematics, history, literature, science, music, drawing and "other hand work" which included carpentry, sewing, gardening, cooking, carving, etc. The estimates were for the last three years of the elementary school, the high school, and college. These studies led to the following conclusions.

> A correlation of 0.6 or 0.7 seems then to be approximately the true degree of resemblance between the relative degree of an interest in a child of from ten to fourteen and in the same person at twenty-one." (24: 453)
>
> "The individual whose interests follow his capacities least closely still shows a substantial resemblance (nearly 0.5). The correlation between an individual's order of subjects for interest and his order for ability is in fact one of the closest of any that are known. A person's relative interests are an extraordinarily accurate symptom of his relative capacities." (24: 455) An average correlation of 0.89 was reported. (23: 179)
>
> "Interests are also shown to be symptomatic, to a very great extent, of present and future capacity or ability. Either because one likes what he can do well, or because one gives zeal and effort to what he likes, or because interest and ability are both symptoms of some fundamental feature of the individual's original nature, or because of the combined action of all three of these factors, interest and ability are bound very closely together. The bond is so close that either may be used as a symptom for the other almost as well as for itself." (24: 456)

Bridges and Dollinger considered it "desirable to determine the correlation between interests, evaluated subjectively by rankings of courses, and abilities, measured objectively by grades obtained in these same courses." (2:309) The correlation between rank in interest and grade earned in Elementary Psychology was 0.22. The correlation between rank in interest and estimated rank in ability was 0.59. Comparable coefficients were reported for English. They concluded that:

> When ability is measured by a more objective means, namely, college grades, a very low correlation between interest and ability is obtained,

so low in fact that one might well be justified in the statement: A person's relative interests are an extraordinarily *in*accurate symptom of his relative capacities. It might also be inferred from data here presented that a person's estimate of his ability is an extraordinarily inaccurate symptom of his real ability, for the correlation between the students' rankings of their courses in ability and the grades obtained is only 0.28." (2: 313)

The original data of Bridges and Dollinger were placed at the disposal of Thorndike for the purpose of comparing "the position in which a college student puts one of the subjects which he is studying for interest to him in comparison with the other subjects which he is studying" and "the mark which he receives in that subject *in comparison with the marks which* HE *receives in other subjects.*" (25:374) In a group of 140 cases studied for this relationship, r had a central tendency of 0.46. For the same data, Thorndike stated that a correlation of 0.70 is obtained when an individual's ranking of subjects for interest is correlated with his ranking of them for his ability in them as he estimates it. He concluded that, "On the whole Bridges' data seem to corroborate the doctrine of a very close relation between the order of an individual's interests and the order of his abilities." (25:376)

Franklin (6) found a high degree of permanence in the vocational interests of Junior High School pupils over a period of a year. In connection with the present study, it is interesting to point out that he also found that pupils with clerical interests made higher scores in a prognostic clerical test than the unselected group.

In a report on "Intelligence and Interest in Vocational Adjustment," Fryer cited data on the occupational interests of 340 men who voluntarily sought advice. Using the Army Alpha as the measure of intelligence, he found "that 75 per cent of these subjects possess more intelligence than that required by their occupations, 9 per cent have the same as required, and 16 per cent have less intelligence than required by the occupation." (9:132) Those applying for advice were requested by the counsellor to indicate occupations that they desired to enter. "Fifty-eight per cent have more intelligence than re-

quired by the desired occupations; 10 per cent the same and 32 per cent have less than required by the occupation." (9:137) Using interest as the sole basis for classification, or vocational placement, led Fryer to conclude that not more than 50 per cent of the cases would be satisfactorily adjusted, so far as intelligence is concerned.

In reviewing the work of Proctor (19), Fryer stated, "Among adolescents, according to a study of 806 high school students, a still higher degree of vocational maladjustment would occur if the subjects were placed in their vocational ambition. $R = + 0.21 \pm 0.02$, for intelligence requirement of the vocational interest and the ability as measured by the mental test." (9:145).

Feingold (5:153) reported on the vocational ambitions of 512 grammar school graduates. An analysis of his data indicates that 7 per cent have more intelligence than needed in the desired occupation; 46 per cent have the same intelligence, and 47 per cent have less intelligence than required. Fifty-four per cent would be maladjusted if placed solely on the basis of interest.

Various attempts have been made to measure interest objectively. Moore worked with sales and design-engineers, using a specially prepared interest analysis blank. He stated,

> "The use of the *Record of Interests* shows that men in different lines of work have different interests. The interests of a person are not in just one specific occupation, but they are general to the extent that they pertain to very similar or closely allied occupations or activities. Interest in a certain class of activities is a criterion that the person will be interested in any other very similar activity. By similar activity is meant one that requires much the same information, training, experience, kind of materials and tools worked with, mental activity, personality, ideals of accuracy and perfection, and social attitude." (16: 81)

Freyd arrived at practically the same conclusion when he compared the personalities of the socially and mechanically inclined. He stated,

> "The results of the group comparisons lead to the conclusion that those who are interested in dealing with human beings (the salesmen) are differentiated from the students of mechanics by greater social

ability, credulity or suggestibility, adaptability, excitability, self-confidence, talkativeness, present-mindedness, and good nature. The students of mechanics show a greater tendency to be self-conscious, careful of details, inhibited and cautious, reticent, absent-minded, and glum. They are more capable of making fine coördinations, and excel in slow, painstaking, and accurate effort. There is no evidence for two corresponding sharply defined types of personality, but evidence points to the utility of recognizing 'extremes,' those few at the social extreme possessing all the traits of the completely socially adapted person, and those at the mechanical extreme possessing all of the traits of the person who is completely devoted to machines or inanimate objects." (8: v-vi)

Hartman and Dashiell (13) studied thirty-one juniors and seniors, using tests of the following types, (a) Word completion, (b) Code writing, (c) Immediate retention of visual impressions, (d) Arithmetic problems, (e) Pitching pennies, and (f) Letter cancellation. When the test program was completed, the subjects ranked the six exercises in order of their interest in them. A correlation of + 0.243 was found between ability, as measured by the tests, and the interest rankings. "As it was, twenty-five of the thirty-one subjects showed positive correlation; and the highest individual positive correlation found was 0.915, while the highest negative correlation was 0.371."

In an attempt to secure some definite, objective measure of interest, Burtt (3) studied a group of 43 agricultural engineering students. The men were given a series of 18 mental tests, designed to indicate both interest and ability. While not conclusive, the report is suggestive of the possibilities of the method of attack. McHale (15) devised an information test based on interests for the purpose of studying the vocational interests of college women. She reported a correlation of + 0.71 between the vocational test and success in Educational and Social Service; + 0.81 between the test and success in Business, and + 0.67 between the test and success in Science.

Cowdery modified the Carnegie Institute of Technology Interest Analysis Blank and measured the expressed attitudes of 34 doctors, 34 lawyers and 37 engineers. A scoring method, devised by Kelley, was employed which differentiated the subjects in terms of their vocational interests. Cowdery stated,

the method "has proved its classificatory efficiency to be between 80 and 90 per cent, and the reliability of its scores to be from 0.77 to 0.90." (4:140)

Strong worked with 1271 records, representing 18 different occupational groups. Items were scored and weighted. In his first paper he shows how personnel managers may be distinguished, on the basis of their interests, from members of twelve other occupations. ". . . . only 3.5 per cent of non-personnel men rated A, i.e., as high as 75 per cent of personnel managers who scored highest on the interest test." (22:235) In his second paper, Strong reported on the interests of personnel men in thirteen other occupations. He stated, "It is very significant that men in these twelve occupations are apt to have the interests of a personnel manager in just about the ratio that personnel managers have interest in their occupations." (22:239)

To explain the striking relationship between interest and ability, Bingham has advanced the interesting theory "that early introversion of personality leads to the development, *through disproportionate exercise*, of one's native interests in mechanism or ideas, at the expense of interest and proficiency in social contacts." (1:359)

"Both interest and ability are functions of personality. Each affects and modifies the other. Vocational ability grows with exercise and training. Interest in any type of activity usually increases with growth of pertinent knowledge and skill. A bent toward introversion, then, is favorable to the enhancement of both interest and ability in dealing with machines, while the opposite sort of personality favours development in social interests and social effectiveness. Such considerations make plausible the facts—at first glance somewhat astonishing—regarding the correspondence found between introversion and vocational interest in mechanisms." (1:360)

Fryer studied 200 vocational counsel subjects and 513 employment applicants in relation to their work interests. The subjects indicated whether they were interested in working with people (*humanics*) or things (*mechanics*). In the voca-

tional counsel group, 55 per cent indicated an interest in humanics; 36 per cent an interest in mechanics, and 9 per cent in both. In the employment applicant group 440 subjects answered the question. Thirty-three per cent were interested in humanics, 19 per cent in mechanics, and 48 per cent in both. Fryer concluded that, "Individuals are unable to make any generalized vocational interest distinctions of significant value for vocational prognosis." (12:309–10)

Additional work with various groups needs to be done before this generalization will be fully accepted. The vocational counsel subjects represented a highly selected group; 70 per cent were "superior" on the basis of the Army Alpha. While the commercial employment agency group may be representative of the general population in intelligence, it still is conceivable that its members do not represent a random sampling of those who are looking for positions. The vast majority of jobs are not filled through the employment agencies. Those applying to such agencies may be lacking in such traits as aggressiveness, self-confidence, ambition, etc. It is possible that the temperamental deficiencies of the group may influence any study of interests of this type. The fact that 48 per cent of the employment agency group indicated an interest in both humanics and mechanics, as compared with 9 per cent in the counsel group, may be indicative of a "decision factor" of considerable importance, so far as the chances of vocational success are concerned.

The findings of the four types of investigations cited seem to justify the following conclusions. The original work of Thorndike, and his review of the data of Bridges and Dollinger, indicate that there is a positive relationship between estimates of interest and estimates of ability. The work of Thorndike and Franklin seems to indicate that interests are permanent. The findings of Franklin and McHale lend evidence to support the theory that interests, when objectively measured, are an indication of ability. The investigations of Fryer, Proctor and Feingold indicate that interest in a *specific occupation* is not a satisfactory criterion of ability so far as intelligence is concerned.

Moore, Freyd and Ream seem to have demonstrated that interests are general rather than specific, and that, with sufficiently broad work classifications, interest may be considered an indication of ability. Cowdery and Strong have developed a technique for scoring interest analysis blanks so as to differentiate those with varying vocational interests.

C. TYPES OF INTEREST AND GENERAL INTELLIGENCE

The present report is based upon a study of 253 male students at the University of Wyoming. The median age of the subjects was 20.16 years. The youngest was born May 1, 1909; the oldest March 18, 1901. The men whose records comprise the data embodied in this report were classified as follows: 175 Freshmen, 46 Sophomores, 25 Juniors and 7 Seniors.

Each of the 253 men indicated his general line of interest on a mimeographed slip which contained the following, "My primary interest is in working with THINGS ( ) PEOPLE ( ) IDEAS ( )." A check mark was placed within the parenthesis following one of the three capitalized words. All the men had been given the Thorndike Intelligence Examination for High School Graduates upon entering the college. The Thorndike score was considered to be a measure of the ability "to manipulate ideas." A group of 125 of the men voluntarily completed the Stenquist Mechanical Aptitude Test No. 1. This record was considered a measure of the ability "to manipulate things." No measure of the ability "to manipulate people" was obtained.

The primary interests of the men were not limited to one field: 107 men, or 42.3 per cent of the total, expressed an interest in *things;* 94 men, or 37.2 per cent indicated an interest in *people,* and 52 men, or 20.5 per cent stated that they were interested in *ideas.* The proportions were consistent for two groups of 125 and 128 men. Table 1 shows the distribution of interests for the four groups.

The Thorndike Intelligence Examination scores ranged from 24 to 115. Table 2 shows the distribution of intelligence scores for the men in each of the interest classifications.

The mean score for those interested in *things* was 64.811 with a standard deviation of 16.85; the mean for the men interested in *people* was 61.063 with a standard deviation of 16.35. For

TABLE 1

Interest of college men

	THINGS	PEOPLE	IDEAS	TOTAL
Freshmen	78	59	38	175
Sophomores	16	23	7	46
Juniors	11	9	5	25
Seniors	2	3	2	7
Total	107	94	52	253
Per cent	42.3	37.2	20.5	100

TABLE 2

Thorndike scores and interest classifications

THORNDIKE	20–24	25–29	30–34	35–39	40–44	45–49	50–54	55–59	60–64	65–69	70–74	75–79	80–84	85–89	90–94	95–99	100–104	105–109	110–114	115–119	CASES
Things	1	2	1	1	4	14	7	19	15	9	8	7	12	3	2	2	1	1		1	107
People		2	1	3	12	8	12	8	14	4	12	5	4	5	1	2	1				94
Ideas				2	2	6	4	4	5	5	4	7	3	2	4	2	1	1			52

TABLE 3

Showing extent of difference between mean scores, Thorndike intelligence examination

	A. DIFFERENCE BETWEEN MEAN SCORES	B. STANDARD DEVIATION OF DIFFERENCE	RATIO A ÷ B
Ideas and people	7.663	2.935	2.61
Ideas and things	3.915	2.907	1.34
People and things	3.748	2.349	1.59

those interested in *ideas* the mean was 68.726 with a standard deviation of 17.50. It is necessary to show whether the differences in the means for the three distributions are sufficiently

great to be considered significant. The standard deviation of the difference was computed for each combination.[1] Table 3 shows the actual differences between the means, the standard deviation of the difference for each pair, and the ratio of the actual difference to the standard deviation of the difference.

Conservative statistical practice does not consider the difference between means significant unless the actual difference is three times the standard deviation of the difference. In Table 3 it has been shown that the actual difference between the means of the intelligence scores for those indicating interest in "ideas" or "people" is 2.61 times the standard deviation of the difference. It has been suggested "that there is about one chance in one hundred and seventy that the smaller mean will equal or exceed the now larger mean if the conditions specified above are true. One may conclude from this that the difference found may be due entirely to chance factors." No significant difference appears to exist between those interested in "ideas and things," or between those interested in "people and things."

D. TYPES OF INTEREST AND MECHANICAL APTITUDE

If those who indicate an interest in ideas tend to make higher scores in such a test as the Thorndike Intelligence Examination, it would be worth-while to determine whether those who indicate an interest in things tend to make higher scores in the Stenquist Mechanical Aptitude Test. No attempt was made to select the men. One hundred and twenty-five reported voluntarily. The scores ranged from 37 to 94. Table 4 shows the distribution of mechanical aptitude scores for each of the interest classifications.

The mean score for those interested in *things* was 80.227 with

[1] Kelley, Truman L. Statistical Method, p. 85 and p. 182. The Macmillan Co., New York, 1923.

Yule, G. Udny. An Introduction to the Theory of Statistics, p. 344f. Charles Griffin & Co., Ltd., London, 1919, fifth ed.

I wish to acknowledge the courtesy of Professor Kelley in replying to my questions concerning the formula used in this report, and also the kindness of Mr. Harold A. Edgerton in checking my computations.

a standard deviation of 8.020; the mean for the men interested in *people* was 71.802 with a standard deviation of 11.40. For those interested in *ideas* the mean was 73.240 with a standard deviation of 15.135. Table 5 shows the actual differences between the means, the standard deviation of the difference for each pair, and the ratio of the actual difference to the standard deviation of the difference.

Table 5 shows that a significant difference exists between the mean scores in the mechanical aptitude test for those indicating

TABLE 4

Stenquist scores and interest classification

STENQUIST	36–39	40–43	44–47	48–51	52–55	56–59	60–63	64–67	68–71	72–75	76–79	80–83	84–87	88–91	92–95	CASES
Things							2	4	6	6	4	10	9	13	1	55
People		1	1	2	1		1	5	9	6	8	3	5	1		43
Ideas	2		1				4	1	1	4	4	6	1	1	2	27

TABLE 5

Showing extent of difference between mean scores, Stenquist Mechanical Aptitude Test

	A. DIFFERENCE BETWEEN MEAN SCORES	B. STANDARD DEVIATION OF DIFFERENCE	RATIO A ÷ B
Things and people	8.425	2.046	4.11
Things and ideas	6.987	3.105	2.25
People and ideas	1.438	3.388	

interest in "things" and "people." In this case, the actual difference between the mean scores is 4.11 times the standard deviation of the difference. No significant difference appears to exist between those interested in "things and ideas," or between those interested in "people and ideas."

E. CONCLUSIONS AND DISCUSSION

1. In a group of 253 male college students whose median age was 20.16 years, 42.3 per cent indicated an interest in things;

37.2 per cent an interest in people, and 20.5 per cent an interest in ideas.

2. The mean scores on the Thorndike Intelligence Examination for the three interest classifications were as follows: ideas, 68.726; things, 64.811; people, 61.063.

3. The actual difference between the mean intelligence scores of those indicating an interest in ideas and those indicating an interest in people was 7.663 points. The actual difference is 2.61 times the standard deviation of the difference. It is estimated that there is one chance in one hundred seventy that the smaller mean will equal or exceed the now larger mean. While this does not prove conclusively that a significant difference exists between the levels of general intelligence for the two groups considered, it may be indicative of a "drift" or "slant," so far as these small groups are concerned.

4. No significant difference appears to exist in the levels of general intelligence for those indicating interest in ideas and things, or between those indicating interest in people and things.

5. The mean scores on the Stenquist Mechanical Aptitude Test for the three interest classifications were as follows: things, 80.227; ideas, 73.240; people, 71.802.

6. The actual difference between the mean mechanical aptitude test scores of those indicating an interest in things and those indicating an interest in people was 8.425 points. The actual difference is 4.11 times the standard deviation of the difference. We conclude that there is little likelihood that the difference found is due to chance. It appears that, for the small number of cases studied, a significant difference exists in the levels of mechanical aptitude for those indicating interest in things and interest in people, respectively.

7. No significant difference appears to exist in the levels of mechanical aptitude for those indicating interest in things and ideas, or between those indicating interest in people and ideas.

8. In both the Thorndike Intelligence Examination, and the Stenquist Mechanical Aptitude Test, those indicating interest in people tended to make lower scores than those indicating interest in ideas or things.

9. The correlation between Thorndike and Stenquist scores for 125 cases was + 0.25.

From the point of view of those engaged in curriculum construction, and in employment management, the indication of interest probably should be given consideration. If the distinctions indicated in this paper hold true for a larger number of cases, and for widely selected groups, it becomes apparent that, in the long run, levels of ability will be approximated, depending upon the types of interests represented. Carrying the hypothesis one step further, it seems that, for the majority of cases, the schools that are organized to train people to work in such fields as authorship, scientific research, etc., should try to attract those interested in ideas. Schools designed to train students to work with things should endeavor to attract those who are interested in things. If later, data are brought forward that indicate that interest in people is an indication of ability "to manipulate people," then the schools that are organized to train people to work with people should endeavor to attract students who are interested in people.

In actual practice, it is obvious that all organizations need people of all three types. This point is admirably illustrated in the case of the typical public utility company. Most of these companies have a commercial department that deals directly with the public; operating and maintenance departments that work primarily with things, and executive and research departments where the major portion of the time is spent in working with ideas. These ideas, it is true, are expressed through the manipulation of people and things. Also, it must be borne in mind that the executive and research departments have no monopoly on ideas. They occur throughout the organization. In such a company, there is a rough division of labor in terms of working with things, people, and ideas. Assuming that all three types of interest are correlated with ability, it will be profitable in the long run for the commercial department to select the majority of its workers from the ranks of those interested in people, for the operating and maintenance departments to specialize in those interested in things, and for the executive

and research departments to look for those interested in ideas. Until methods of measuring interest objectively are perfected, the vocational counsellor and the employment manager will have to rely upon personal estimates of interests if they consider this factor in placement.

REFERENCES

(1) BINGHAM, W. V.: Personality and vocation. The British Journal of Psychology (Gen. Sec.), Vol. 16, April, 1926, Part 4, pp. 354–362.

(2) BRIDGES, JAMES W., AND DOLLINGER, V. M.: The correlation between interests and abilities in college courses. Psychological Review, Vol. 27, July, 1920, pp. 308–314.

(3) BURTT, HAROLD E.: Measuring interest objectively. School and Society, Vol. 17, No. 434, April 21, 1923, pp. 444–448.

(4) COWDERY, KARL M.: Measurement of professional attitudes. Differences between lawyers, physicians and engineers. The Journal of Personnel Research, Vol. 5, No. 4, August, 1926, pp. 131–141. Bibl.

(5) FEINGOLD, GUSTAVE, A.: The relation between the intelligence and vocational choices of high school pupils. Journal of Applied Psychology, Vol. 7, No. 2, June, 1923, pp. 143–153.

(6) FRANKLIN, EDWARD E. The permanence of the vocational interests of junior high school pupils. Johns Hopkins University Studies in Education, No. 8, Baltimore, Md., Johns Hopkins Press, 1924, pp. vii, 61.

(7) FREYD, MAX: A method for the study of vocational interests. Journal of Applied Psychology, Vol. 6, No. 3, September, 1922, pp. 243–254.

(8) FREYD, MAX.: The personalities of the socially and the mechanically inclined. Psychological Monographs, Vol. 33, No. 4, 1924, Whole No. 151.

(9) FRYER, DOUGLAS: Intelligence and interest in vocational adjustment. The Pedagogical Seminary, Vol. 30, No. 2, June, 1923, pp. 127–151. Bibl.

(10) FRYER, DOUGLAS: Occupational-intelligence standards. School and Society, Vol. 16, No. 401, September 2, 1922, pp. 273–277.

(11) FRYER, DOUGLAS: The significance of interest for vocational prognosis. Mental Hygiene, Vol. 8, No. 2, April, 1924, pp. 466–505.

(12) FRYER, DOUGLAS: Types of work. A note on vocational interest. Journal of Applied Psychology, Vol. 9, No. 3, September, 1925, pp. 304–310.

(13) HARTMAN, ROSS, AND DASHIELL, J. F.: An experiment to determine the relation of interests to abilities. The Psychological Bulletin, Vol. 16, No. 8, August, 1919, pp. 259–262.

(14) KITSON, H. D.: Intelligence as a criterion in vocational guidance. Educational Review, Vol. 52, November, 1916, pp. 349–356.

(15) MCHALE, KATHRYN: An experimental study of the vocational interests of a liberal arts college group. Journal of Applied Psychology, Vol. 8, No. 2, June, 1924, pp. 245–255.

(16) MOORE, BRUCE V.: Personnel selection of graduate engineers. Psychological Monographs, Vol. 30, No. 5, 1921, Whole No. 138.

(17) POULL, LOUISE E.: Interest in relation to intelligence. Ungraded, Vol. 7, April, May, June, 1922, pp. 145–158; 176–192; 200–222.

(18) PROCTOR, WM. M.: Educational and Vocational Guidance. Exploration of Special Interests and Abilities. Chapter IV, pp. 64–83. Houghton Mifflin Co., 1925.

(19) PROCTOR, WM. M.: The use of psychological tests in vocational guidance of high school pupils. Journal of Educational Research, Vol. 2, No. 2, September, 1920, pp. 533–546.

(20) REAM, M. J.: Ability to Sell. Personnel Research Series, No. 2, The Williams & Wilkins Co., Baltimore, 1924.

(21) STRONG, EDW. K., JR.: An interest test for personnel managers. The Journal of Personnel Research, Vol. 5, No. 5, September, 1926, pp. 194–203.

(22) STRONG, EDW. K., JR.: Interest analysis of personnel managers. The Journal of Personnel Research, Vol. 5, No. 6, October, 1926, pp. 235–242.

(23) THORNDIKE, E. L.: Early interests: Their permanence and relation to abilities. School and Society, Vol. 5, No. 111, February 10, 1917, pp. 178–179.

(24) THORNDIKE, E. L.: The permanence of interests and their relation to abilities. Popular Science Monthly, Vol. 81, November, 1912, pp. 449–456.

(25) THORNDIKE, E L.: The correlation between interests and abilities in college courses. Psychological Review, Vol. 28, 1921, pp. 374–376.

(26) WYMAN, JESSIE B.: On the influence of interest on relative success. Unpublished Ph.D. thesis, Leland Stanford University, 1924.

SOME FACTORS INVOLVED IN JUDGING PERSONAL CHARACTERISTICS

ROY M. DORCUS

Johns Hopkins University

The earlier investigators in the field of personality study were interested primarily in the ability of various people to judge either themselves or others and the reliability of the judgments. Examples of this type of work are found in the reports of Cattell and Hollingworth. A different type of work has been undertaken by Woodworth and others in their tests of emotional instability. Under this type many of the case history forms, which have been developed for psychiatric use, might be included. These, however, are not tests and hence are of little practical value for experimental work. In regard to work on psychopathic personalities, it will suffice to mention two rather distinct lines of work that have been undertaken, namely, the association tests devised by Kent and Rosanoff and the physiological work developed by Travis. A still different course has been pursued by Pressey and Downey in their respective tests—The Pressey X-O Test and the Downey Will-Temperament Test. Pressey has attempted to discover certain trends of personality by having the subject select from a list of words, the word or words which the subject feels may be in correspondence with the particular stimulus word. Downey has endeavored to ascertain what qualities an individual possesses, by constructing a particular situation for each of the qualities for which the test is supposed to be a measure. It was in this test that the time factor was first given significant weight.

The neglect in previous studies of the time factor as index of difficulty and also the neglect of sex differences has seemed to make a much more careful study of these factors desirable.

For the present investigation, a list of characteristics was selected, of which certain ones were chosen as being of importance for detecting possible abnormal tendencies; others were included because they were of importance for determining the general makeup of the individual. The following sample sheet will show the actual characteristics used.

Name..... Date.....

Indicate your judgment of the personal characteristics of,

.....

by checking in the appropriate column in front of each characteristic.

ABOVE AVERAGE	BELOW		ABOVE AVERAGE	BELOW	
		Honesty			Fondness for children
		Height			Mathematical ability
		Obstinacy			Devotion to duty
		Kindness			Ingenuity
		Reliability			Artistic appreciation
		Good looks			Fondness for animals
		Orderliness			Tendency to worry
		Awkwardness			Memory capacity
		Recklessness			Conversational ability
		Self-confidence			Leadership
		Intelligence			Love of sports
		Truthfulness			Interest in politics
		Vanity			Quarrelsomeness
		Industry			Egotism
		Loyalty			Maliciousness
		Wit			Neatness of dress
		Caution			Liking for perfume
		Modesty			Skill in card playing
		Fluency			Bodily vigor
		Extravagance			Interest in the other sex
		Tactfulness			Carefulness in money matters
		Ambition			Attractiveness to the other sex
		Quickness			Fondness for reading
		Cheerfulness			Religiousness
		Laziness			Reasoning ability

TABLE 1

Showing the average time required by the males to judge each characteristic

	AVERAGE TIME FOR FRIEND	ST. D.	AVERAGE TIME FOR SELF	ST. D.
Ingenuity	1.6	0.5	1.8	0.7
Reasoning ability	1.6	0.6	1.8	0.5
Egotism	1.6	0.5	2.08	0.7
Mathematical ability	1.7	0.6	2.06	0.8
Love of sports	1.7	0.4	1.8	0.6
Artistic appreciation	1.7	0.5	2.04	0.9
Devotion to duty	1.8	0.7	2.0	0.6
Interest in politics	1.8	0.5	2.06	0.8
Conversational ability	1.8	0.5	2.2	0.7
Leadership	1.8	0.7	1.8	0.5
Religiousness	1.9	0.6	1.7	0.5
Maliciousness	1.9	0.8	2.2	0.9
Fondness for animals	1.9	0.7	2.04	0.7
Memory capacity	2.0	0.7	2.3	0.6
Neatness of dress	2.0	0.7	2.0	0.6
Skill in card playing	2.0	0.7	2.04	0.7
Quarrelsomeness	2.0	0.7	2.2	0.7
Interest in the other sex	2.02	0.5	2.2	0.6
Carefulness in money matters	2.04	0.6	2.8	1.02
Cheerfulness	2.04	0.9	2.0	0.9
Bodily vigor	2.1	0.9	2.0	0.6
Liking for perfume	2.1	0.4	2.06	0.4
Tendency to worry	2.1	0.9	2.3	0.8
Fondness for reading	2.1	0.7	2.2	0.8
Attractiveness to other sex	2.2	0.7	2.4	0.7
Laziness	2.2	1.4	1.8	0.8
Quickness	2.2	0.8	1.8	0.6
Ambition	2.2	0.7	2.0	0.9
Wit	2.2	0.9	1.8	0.5
Loyalty	2.2	1.04	1.9	1.04
Intelligence	2.2	1.1	2.06	0.9
Kindness	2.2	0.8	1.9	0.7
Reliability	2.3	1.4	2.02	1.0
Good looks	2.3	1.0	1.9	0.6
Orderliness	2.4	0.5	2.9	0.8
Extravagance	2.4	1.1	2.2	0.7
Industry	2.4	1.1	2.0	0.5

TABLE 1—*Concluded*

	AVERAGE TIME FOR FRIEND	ST. D.	AVERAGE TIME FOR SELF	ST. D.
Vanity	2.4	0.9	2.04	0.7
Truthfulness	2.4	1.4	2.2	0.8
Self-confidence	2.5	1.02	2.2	0.9
Tactfulness	2.5	0.9	2.4	1.2
Recklessness	2.5	0.8	2.5	1.4
Height	2.5	1.1	1.8	0.4
Awkwardness	2.6	1.3	2.2	0.8
Fluency	2.6	1.2	2.1	0.9
Obstinacy	2.7	1.1	2.2	0.8
Caution	2.7	2.0	2.4	1.1
Modesty	2.9	1.7	2.4	0.7

Fifty individuals of each sex[1] were tested. They were asked to pick out some friend of their own sex whom they knew well and of whose personal characteristics they could judge. They were then given a pencil,[2] arranged with electrical contacts, and were asked to check the person whom they chose on the list of traits presented. The time taken to check each trait was measured in fifths of a second. When the reactors had completed checking one-half the number of traits, they were stopped. They were then told to judge themselves on the same traits. Upon finishing this they were given the second half of the list and were then asked to judge themselves on those traits. Following that, they judged their friend in regard to the second half of the list.

The same characteristics were presented to another group of 50 men and 80 women. Each individual of this group was asked to judge himself on the traits. The individuals of this same group were then told to rate each characteristic as desirable, unde-

[1] The subjects used in this experiment were undergraduate students in Psychology in Goucher College and this University.

[2] Dorcus, Roy M.: A contact pencil for psychological use. Jour. Comp. Psychol., vol. 6, no. 5, October, 1926.

TABLE 2

Showing the average time required by the females to judge each characteristic

	AVERAGE TIME FOR FRIEND	ST. D.	AVERAGE TIME FOR SELF	ST. D.
Reasoning ability	1.6	0.5	1.7	0.5
Religiousness	1.7	0.5	2.04	0.7
Ingenuity	1.7	0.6	2.06	0.6
Mathematical ability	1.7	0.6	2.0	0.8
Love of sports	1.8	0.6	1.8	0.6
Leadership	1.8	0.8	1.9	0.5
Egotism	1.8	0.7	2.2	0.8
Cheerfulness	1.8	0.7	2.08	0.9
Interest in politics	1.9	0.5	2.1	0.6
Maliciousness	1.9	0.8	2.4	1.1
Conversational ability	1.9	0.6	2.1	0.6
Laziness	1.9	0.8	1.9	1.02
Fondness for reading	2.02	0.7	2.3	0.8
Bodily vigor	2.04	0.7	2.1	0.6
Liking for perfume	2.04	0.6	2.2	0.6
Artistic appreciation	2.04	0.7	2.2	0.8
Devotion to duty	2.04	0.8	2.2	0.9
Wit	2.04	0.6	1.8	0.6
Neatness of dress	2.06	0.7	2.1	0.6
Interest in the other sex	2.08	0.8	2.2	0.6
Skill in card playing	2.1	0.7	2.1	0.5
Fondness for animals	2.1	0.7	1.9	0.6
Quarrelsomeness	2.1	0.7	2.3	0.7
Attractiveness to other sex	2.2	0.7	2.7	1.2
Memory capacity	2.2	0.8	2.2	0.7
Intelligence	2.2	0.6	1.9	0.5
Quickness	2.2	0.9	2.06	0.8
Tendency to worry	2.2	0.7	2.3	0.7
Loyalty	2.3	1.08	2.3	1.3
Truthfulness	2.3	1.02	2.2	0.9
Reliability	2.3	0.8	2.3	0.9
Good looks	2.4	1.1	2.08	0.7
Modesty	2.5	0.9	2.08	0.8
Kindness	2.5	0.8	2.08	0.7
Tactfulness	2.5	0.9	2.2	0.9
Ambition	2.5	1.2	2.1	0.8
Carefulness in money matters	2.5	1.1	2.7	0.9

TABLE 2—*Concluded*

	AVERAGE TIME FOR FRIEND	ST. D.	AVERAGE TIME FOR SELF	ST. D.
Extravagance	2.5	1.1	2.3	1.06
Vanity	2.6	1.2	2.4	0.8
Self-confidence	2.6	0.6	2.1	0.5
Industry	2.6	1.1	2.3	0.9
Height	2.6	0.6	1.9	0.7
Fluency	2.7	1.1	2.2	0.8
Orderliness	2.7	1.06	2.3	0.8
Awkwardness	2.8	1.2	2.3	1.2
Caution	2.8	1.2	2.7	1.5
Recklessness	2.8	1.4	2.5	1.2
Obstinacy	3.0	0.9	2.3	1.2

sirable, or neutral for their own sex and also for the opposite sex.

The tabulation of the data obtained from the foregoing procedure shows some rather interesting results. If we consider the average time (tables 1 and 2) required by the group to judge each characteristic, we find that the times are unreliable. That is, the Probable Error of the Difference of the Averages is nearly as great as the Difference of the Averages. This may have two possible explanations. The measurements obtained may not be fine enough or different individuals may have difficulty with different traits. If the latter is true, a composite of the judgments for a single trait would tend to cause these differences to flatten out. It is worth while to note certain other points which these tables bring out. If tables 1 and 2 are examined, it will be found that those traits in regard to which the men have been able to make quick decisions in characterizing their friends and themselves are the same traits in regard to which women have also been able to make quick decisions; and the same correspondence appears in the slow decisions of the two sexes. The coefficient of correlation between the time taken by the males to judge their friends and

the time taken by the females to judge their friends is 0.87 ± 0.02. The coefficient for the same groups in judging themselves is 0.80 ± 0.03. There is little relation between the time taken to judge one's friend and the time taken to judge one's self on any given trait for either the male or female group. The coefficients are 0.40 ± 0.08 and 0.32 ± 0.10 for the males and females respectively.

The men require from 0.3 to 0.7 second more to judge their friends than themselves on seventeen of the traits and from 0.3 to 0.5 second more to judge themselves than their friends on seven of the traits. The women require from 0.3 to 0.7 second longer in judging their friends on thirteen traits and from 0.3 to 0.5 second longer in judging themselves on seven traits. There is a rather general agreement between the two sexes as to the traits which require longer to judge for their friends than for themselves and vice versa.

The range of time is rather uniform for the male and female groups with reference to both their friends and themselves. The range for the male group is from 1.6 to 2.9 seconds for judging their friends and from 1.7 to 2.9 seconds for judging themselves. The range for the female group for judging their friends is from 1.6 to 3 seconds, and for judging themselves from 1.7 to 2.7 seconds.

The characteristic for the female group, when judging their friends, which has the greatest standard deviation is *recklessness;* the one having the greatest standard deviation, when judging themselves is *caution*. Reasoning ability, religiousness, and interest in politics, each has a standard deviation of 0.5 for the female group when judging their friends. Reasoning ability, leadership, skill in card playing, intelligence, and self-confidence, each has a standard deviation of 0.5 for the same group in judging themselves. The smallest deviation which occurred for any of the female judgments was 0.5. The largest deviation for the male group is obtained for caution and recklessness. Caution gave the greatest deviation for their judgment of their friends and recklessness gave the greatest deviation for their judgment of themselves. The relation between recklessness

and caution is reversed by the female group. Caution and recklessness have high deviations for both groups and for both sexes. Love of sports and liking for perfume show the smallest deviation (0.4) by the males in their judgments of their friends; liking for perfume and height show the smallest in their judgment of themselves. The tendencies which have been pointed out suggest that more than just chance determines how much time is required to judge each characteristic.

TABLE 3

Showing the average time required to judge the 48 characteristics in seconds

	MEN		WOMEN		DIF. AVG.	P.E.D.A.
Group 1 requiring longer time to judge themselves						
Average time for themselves	100.7	P.E. 10.5	116.3	P.E. 26.1	15.5	6.5
Average time for friend.....	91.6	P.E. 10.2	107.7	P.E. 23.7	16.1	6.2
Dif. Avg.....	9.1	P.E.D.A. 2.9	8.5	P.E.D.A. 8.5		
Group 2 requiring longer time to judge friends						
Average time for themselves	100.5	P.E. 19.2	98.7	P.E. 11.1	1.8	3.9
Average time for friend.....	110.0	P.E. 19.7	109.8	P.E. 13.6	0.2	4.2
Dif. Avg.....	9.4	P.E.D.A. 4.8	11.1	P.E.D.A. 3.1		

Table 3 shows the average time in seconds required for judging all the traits. Group 1 in this table contains the individuals who required longer time to judge themselves and group 2 contains those individuals who required longer time to judge their friends. One point of particular interest in this table is, that in the second group the men and women require about the same time for judging their friends and for judging themselves, while in the first group the women need a longer

TABLE 4

Showing the characteristics as classified by the females for the male group and as classified by the males for themselves

	FEMALES					MALES				
	1	2	3	4	5	1	2	3	4	5
Height	✓								36 60	
Obstinacy		✓					✓			
Kindness	✓					✓				
Reliability	✓					✓				
Good looks				42.5 57.5					46 54	
Orderliness	✓					✓				
Awkwardness		✓					✓			
Recklessness		✓					✓			
Self-confidence	✓					✓				
Intelligence	✓					✓				
Truthfulness	✓					✓				
Vanity		✓					✓			
Industry	✓					✓				
Loyalty	✓					✓				
Wit	✓					✓				
Caution	✓					✓				
Modesty				60 40		✓				
Fluency	✓					✓				
Extravagance		✓					✓			
Tactfulness	✓					✓				
Ambition	✓					✓				
Quickness	✓					✓				
Cheerfulness	✓					✓				
Laziness		✓					✓			
Mathematical ability				56.2 43.8					48 44	
Devotion to duty	✓					✓				
Ingenuity	✓					✓				
Artistic appreciation	✓					✓				
Fondness for animals	✓								48 52	
Tendency to worry		✓					✓			
Memory capacity	✓					✓				

TABLE 4—*Concluded*

	FEMALES					MALES				
	1	2	3	4	5	1	2	3	4	5
Conversational ability	✓					✓				
Leadership	✓					✓				
Love of sports	✓								60 40	
Interest in politics	✓								42 50	
Quarrelsomeness		✓					✓			
Egotism		✓					✓			
Maliciousness		✓					✓			
Neatness of dress	✓					✓				
Liking for perfume		✓								60 40
Skill in card playing			✓					✓		
Bodily vigor	✓					✓				
Interest in the other sex			✓						44 54	
Carefulness in money matters	✓					✓				
Attractiveness to other sex				60 38.8					44 54	
Fondness for reading	✓					✓				
Religiousness	✓								56 32	
Reasoning ability	✓					✓				

1, desirable; 2, undesirable; 3, neutral; 4, desirable-neutral; 5, undesirable-neutral.

time than the men for judging both themselves and their friends. By comparing the time required to judge one's self with the time required to judge one's friend certain tendencies are quite evident. These total measurements should throw some light on the makeup of the individual making the judgments. If in conjunction with these measurements, the traits are noted which require an excessively long time to judge—excessively long with respect to the individual's average time for judging any trait—one might ascertain whether the subject has egocentric or the reverse tendencies.

TABLE 5

Showing the characteristics as classified by the males for the female group and as classified by the females for themselves

	FEMALES					MALES				
	1	2	3	4	5	1	2	3	4	5
Height			✓							44 52
Obstinacy					62 38		✓			
Kindness	✓					✓				
Reliability	✓					✓				
Good looks				53 47		✓				
Orderliness	✓					✓				
Awkwardness		✓					✓			
Recklessness		✓								58 32
Self-confidence	✓					✓				
Intelligence	✓					✓				
Truthfulness	✓					✓				
Vanity					61 35		✓			
Industry	✓					✓				
Loyalty	✓					✓				
Wit	✓					✓				
Caution	✓					✓				
Modesty	✓					✓				
Fluency	✓								54 40	
Extravagance		✓					✓			
Tactfulness	✓					✓				
Ambition	✓					✓				
Quickness	✓					✓				
Cheerfulness	✓					✓				
Laziness		✓					✓			
Mathematical ability				31 68				✓		
Devotion to duty	✓					✓				
Ingenuity	✓					✓				
Artistic appreciation	✓					✓				
Fondness for animals				63 37					42 56	

TABLE 5—*Continued*

	FEMALES					MALES				
	1	2	3	4	5	1	2	3	4	5
Tendency to worry		✓					✓			
Memory capacity	✓					✓				
Conversational ability	✓					✓				
Leadership	✓								44 50	
Love of sports				58 42					60 40	
Interest in politics				48 52						24 62
Quarrelsomeness		✓					✓			
Egotism		✓					✓			
Maliciousness		✓					✓			
Neatness of dress	✓					✓				
Liking for perfume			✓						60 20	
Skill in card playing			✓					✓		
Bodily vigor	✓					✓				
Interest in the other sex			✓			✓				
Carefulness in money matters	✓					✓				
Attractiveness to other sex				55 45		✓				
Fondness for reading	✓					✓				
Religiousness	✓								52 40	
Reasoning ability	✓					✓				

1, desirable; 2, undesirable; 3, neutral; 4, desirable-neutral; 5, undesirable-neutral.

The measurements also show that 32 of the 50 males tested required longer to judge their friends than themselves; 17 showed the reverse relation; and one took the same time. This ratio of approximately 2:1 holds true also for the females. The actual figures are the same as quoted for the males.

Another factor of importance in this work is the influence of the desirability of the trait judged upon the time taken to judge it. Before times can be compared for judging the de-

sirable, undesirable, and neutral traits, it is necessary to know just which ones belong to which group. It is also of importance to know whether the males and females place the same traits in the same groups. Tables 4 and 5 show the characteristics in their respective classifications. Under column head "Female" in table 4 are the judgments of the females concerning the desirability of the traits for the opposite sex, and in table 5 their judgments for their own sex. Under column headed "Males" in table 4 are recorded the judgments of the males for their own sex, and in table 5 their judgments for the opposite sex. Wherever a trait is listed by a check mark in the desirable, undesirable, or neutral groups, it indicates that 70 per cent or over of the individuals tested, placed the trait in that group. Two other classifications also appear, namely, "Desirable-Neutral" and "Undesirable-Neutral." These classifications mean that the preponderance of the choices fell into either one or the other of the pair in each classification, but that neither received a sufficiently large percentage to make the trait decisively either one or the other. For the traits listed under those groups, the actual percentages are quoted in the same order as the grouping. For example, in table 4 *good looks* under the grouping "Desirable-Neutral" received 42.5 to 57.5 per cent which indicates that 42.5 per cent of the individuals thought it desirable and 57.5 per cent thought it a neutral trait. These tables show that both the men and women, with but few exceptions, classified the traits in the same way. They agree rather generally that the traits which are desirable for their own sex are also desirable for the opposite sex. Also, it may be said that those traits which men consider desirable for men, the women also consider desirable for men. This same condition holds true for the neutral and undesirable traits. The exceptions can be ascertained easily by glancing at the tables. No further elaboration is necessary at this point. Reference will hereafter be made to desirable, undesirable, and neutral traits on a basis of the groupings just described.

Table 6 shows the distribution of judgments in percentages

for the different groups of traits. If, for example, we take the group of traits which the males think desirable, we find that 28.6 per cent of the reactors judged themselves above the average, 60.2 per cent average, and 11.2 per cent below the average. Of the 28.6 per cent who judged themselves above the average, 26.7 per cent thought the traits desirable, 0.2 per

TABLE 6

Showing the relationship between the classification of the traits and the amount which the individuals believe they possess of the traits

	ABOVE			AVERAGE			BELOW		
	Desirable	Undesirable	Neutral	Desirable	Undesirable	Neutral	Desirable	Undesirable	Neutral
Males									
Desirable	26.7	0.2	1.7	53.8	0.3	6.1	8.8	0.6	1.8
Undesirable	0.6	11.0	2.0	1.2	37.8	6.8	0	39.0	1.6
Neutral	2.0	2.0	8.0	8.0	0	32.0	2.0	16.0	30.0
Desirable-Neutral	13.0	0	5.0	23.3	1.1	27.9	5.9	7.5	16.3
Total traits	18.2	2.4	2.6	35.3	8.4	11.3	6.2	10.2	5.4
Females									
Desirable	16.4	0.1	1.2	60.9	0.1	5.7	12.2	0.1	3.3
Undesirable	0.4	12.1	2.0	0.1	49.7	4.4	0.4	28.8	2.1
Neutral	2.2	1.0	8.5	12.0	0	39.0	6.0	4.8	26.5
Desirable-Neutral	15.0	0	6.2	28.8	0.2	20.0	11.3	0.2	18.3
Undesirable-Neutral	0.6	12.4	8.1	1.3	36.9	25.0	0	11.9	38.0
Total traits	11.4	2.7	2.9	39.8	9.9	11.2	9.1	5.8	7.2

cent thought the traits undesirable, and 1.7 per cent thought them neutral. The percentages show then that most of the individuals believe they are average or above in the traits which they consider desirable; in the traits which they consider undesirable they rate themselves average or below, and for the traits which they consider neutral they also rate themselves

average or below. This relation holds true for both sexes, but there is one sex difference that ought to be noted: more of the females think they are average in the desirable characteristics than do the males. This increase in the "average" column is made at the expense of the column marked "above the average."

TABLE 7

Average time, in seconds, required to make respective judgments

	ABOVE	ST. D.	AVERAGE	ST. D.	BELOW	ST. D.
Females						
Friend:						
Desirable	2.08	0.3	2.3	0.3	2.2	0.4
Undesirable	2.3	0.4	2.3	0.3	2.3	0.5
Neutral	2.04	0.5	2.1	0.2	2.1	0.3
Desirable-Neutral	1.9	0.3	2.08	0.18	2.2	0.3
Self:						
Desirable	2.2	0.4	2.1	0.2	2.1	0.3
Undesirable	2.3	0.3	2.3	0.2	2.2	0.3
Neutral	2.02	0.2	2.1	0.2	2.0	0.1
Desirable-Neutral	1.9	0.2	2.2	0.2	2.0	0.3
Males						
Friend:						
Desirable	2.06	0.2	2.1	0.3	2.1	0.4
Undesirable	2.2	0.3	2.1	0.3	2.2	0.3
Neutral	....	...	....	....	...	...
Desirable-Neutral	1.8	0.2	2.0	0.18	1.9	0.2
Self:						
Desirable	2.1	0.3	1.9	0.18	2.2	0.4
Undesirable	2.3	0.2	2.0	0.16	2.1	0.3
Neutral	....	...	....	....	...	...
Desirable-Neutral	2.1	0.3	2.1	0.16	2.0	0.2

Table 7 shows the average time required to judge any trait falling into any one of the given groups. Thus 2.08 represents the average time in seconds taken to judge any desirable trait when the individual marks his friend above the average. These times are computed by finding the average time required by

the individuals to judge each trait. These average times are then grouped according as to whether the trait falls into the desirable, undesirable, or neutral category and the average of these measurements is then obtained. The times thus secured are for the most part statistically unreliable. The standard deviation is in most cases large for the differences in the averages. There are certain tendencies, however, which are apparent, namely, that the females take on the average longer than do the males for making judgments above the average, average, and below the average both in the case of themselves and of their friend. By both the male and female groups, a somewhat longer time is consumed in estimating undesirable traits than in estimating desirable traits or neutral traits.

In summarizing, one may say:

1. That it does require longer to judge some characteristics than others. However, on account of the individual differences in the time required by different persons to judge the various traits, the average time taken by a group of people to judge one trait is not significantly different from the time taken to judge another trait.

2. That about twice as many people need longer time to judge their friends than to judge themselves.

3. That there is rather general agreement as to the traits which both sexes consider desirable, undesirable, and neutral for themselves and for each other.

4. That there is a tendency to require a longer time to judge the undesirable traits.

5. That the amount of time taken to make a judgment above the average, average, or below the average is about the same.

6. That the women require, on the average, longer time for judging the traits than do the men.

7. That the relation between the desirability of a trait and the individual's rating of himself in regard to that trait, is about as would be expected. Individuals tend to class themselves as above the average or average in the traits which they consider desirable and as below the average or average in the traits which they consider undesirable or neutral.

8. That further study of individual differences in the time required to judge different traits, in themselves and in others, is desirable, and may lead to useful methods of determining the personal characteristics of those by whom the judgments are made.

A CASE OF SPECIAL ABILITY WITH BELOW AVERAGE INTELLIGENCE

JUNE E. DOWNEY

University of Wyoming

Some years ago I had a chance to give an intelligence test to a man demonstrating memory stunts on various platforms under the title "World's Champion on Memory." The results of the test are exceedingly interesting since there was no question of the man's remarkable gift in repeating from memory numbers seen on cash registers, automobiles, freight cars that he had seen casually with no time for intensive study. I myself heard him repeat from memory numbers on freight trains in the order in which they had passed him while serving as brakeman, the record covering several pages in the notebook of the conductor under whom he worked.

Tested in the laboratory under the usual conditions that would be used in determining the visual memory span for digits, he repeated 27 digits with three errors in reproduction. He knew and stated the position of the numerals but did not give them in serial order, breaking them up into certain groups. He found it difficult to conform to the laboratory procedure in the presentation of the digits and in the timing of the memorizing. Accordingly a second set of 27 digits was presented to him. In this case he took the cards upon which the digits were printed in his own hand and studied them for approximately 70 seconds. They were then reproduced accurately, about 28 seconds being taken for the reproduction. He was then asked to give the two sets that he had memorized, 54 digits in all, and succeeded with no new stimulation in reproducing 35 in their proper order.

This record is certainly an extraordinary one, and particularly when considered in the light of the subject's score on an

intelligence test. The intelligence test given him was the Terman Adult Test. I commenced with year XIV. I realized later that I should have commenced with an earlier year test. His I.Q. was 92.6 and this would probably have been lowered had the XII year test been given.

The test revealed some very interesting inequalities in capacity, for example, high-power visual with little evidence of average auditory memory, and little capacity to handle problems that involved reasoning. For example, the clock test in year XIV was handled very rapidly, but the code test in year XVI was not handled successfully. It was evident that the subject visualized in spots but got no idea of the relationships involved. The auditory memory test of 6 digits backwards caused him some trouble, while he failed on all three of the 8 digit tests as given, orally, for year XVIII.

His repetition of the passages used in year XVIII for logical memory was most interesting. The first one is "Tests such as we are now making are of value both for the advancement of science and for the information of the person who is tested. It is important for science to learn how people differ and on what factors these differences depend. If we can separate the influence of heredity from the influence of environment we may be able to apply our knowledge so as to guide human development. We may thus in some cases correct defects and develop abilities which we might otherwise neglect." He reported that he had seen this piece of "scripture" on a pennant in the Panama Exposition, and this is his reproduction of the passage: "Science to figure out the absolute of each person of mind and lead to benefit for education, leading towards a better success for education or uplift of humanity."

I may say that as regards auditory memory he was sure that he could duplicate his visual achievements in this second field if he cared to do so. He had not, however, been interested enough to try it.

The subject showed very little penetration in handling the fable tests. The moral, for instance, for the fable of the milkmaid and her pans was stated as follows: "To deal without

doubts and to protect without chance." In this instance the subject is seeking to explain his own philosophy of memory, namely, that if individuals would trust their memories all might achieve remarkable results. He is continually urging people to allow no doubts to enter their minds. He is not the only adult that in my experience with the fables has interpreted them in accordance with his own favorite philosophy.

The vocabulary test showed in a very clear-cut fashion the subject's limitations in the way of precise ideas, his inclination to resort to wild guessing and his tendency to grandiloquent verbiage. To give a few examples. "Perfunctory" he defined as "intent of positive;" "cameo" as "retaining view," "promontory" as "intent to be prompt," "gelatinous" as "intent of language."

The test was most enlightening as the subject's special ability stood out in a startling fashion against a background of the most mediocre comprehension. The secret of his achievement is probably interest in numbers, developed by his work, and a consequent playing with them which led to certain definite habits of grouping them and handling the groups as units.

NOTES AND NEWS

Prof. Jesse H. White, head of the Department of Psychology, University of Pittsburg, reports the following additions: Harry M. Johnson, Ph.D., Lecturer; Omar C. Held, John T. Seaton, Alfred J. Dietze, Instructors; Grace Jones, Inez Love, Graduate Assistants.

Teachers College, Columbia, has received a gift of $100,000 from Mrs. Richard H. Hoe for the purpose of endowing a professorship in education. Prof. George A. Coe is to be retired from active service February 1, 1927.

The Department of Psychology, University of Kentucky, is now able to devote more attention to personnel problems and clinical, abnormal and social psychology. Gardner C. Bassett and James L. Graham have been appointed Associate and Assistant Professor respectively. Provision has been made for a graduate laboratory assistant and two graduate scholars.

From November 29 to December 11 at Clark University the Case For and Against Psychical Research was discussed in a series of lectures by Professors Joseph Jastrow, F. C. S. Schiller, Hans Driesch, Drs. L. R. Crandon, Walter F. Prince and Gardner Murphy; Mr. Frederick B. Bond and Mrs. Margaret Deland. Manuscripts were received from Sir Arthur Conan Doyle, Mrs. Mary Austin, and Professors William McDougall and John E. Coover.

New York University reports the appointment of Dr. L. H. Lanier as Instructor in Psychology. Professors Robert McDougall and J. E. Lough are on leave of absence, the latter with the "Floating University" which is now in Pacific waters.

The University of Kansas, Department of Psychology, announces the appointment of Dr. Harry Helson as Assistant Professor to succeed Dr. William T. Heron who has accepted appointment to a similar position in the University of Minnesota.

Wittenberg University, Springfield, Ohio, reports Dr. Homer G. Bishop as Associate Professor and Dr. Margaret Kincade Bishop as Assistant Professor of Psychology.

Dr. Grace Arthur of the Child Guidance Clinic, Amherst Wilder Charity, St. Paul, Minn., has received a grant from the Commonwealth Fund for use in restandardizing the new Point Performance Scale described in this Journal, December 1925.

The University of California reports the appointment of Dr. E. G. Wever as Instructor in Psychology. Dr. Olga Bridgman, Associate Professor, offered courses at Columbia University during the past summer and attended the International Congress of Psychology at Grönigen and will visit European clinics while on a sabbatical leave. Dr. George M. Stratton will return as head of the department after serving a year in Washington as chairman of the Division of Anthropology and Psychology of the National Research Council.

Rutgers College, Department of Philosophy and Psychology, has inaugurated this year a Psychological Clinic for school children, juvenile court cases and university students. Sidney A. Cook, formerly instructor, now Assistant Professor, is in charge.

The University of Cincinnati has in prospect a newly organized department of Educational Psychology directed by Prof. Harlin C. Hines with seven additional personnel members.

The University of Wisconsin will have this year as a member of its staff Prof. Kurt Koffka of Germany. Prof. Jastrow has a year's leave of absence. Prof. Clark L. Hull has established a correlation service made possible by his invention of a new automatic correlation machine. Upon application an estimate of the cost of solving problems in correlation will be given.

The University of Wyoming has granted leave of absence from September to April to Prof. R. S. Uhrbrock. Miss Nancy Bayley, University of Iowa, is a new member of the psychology staff.

Ohio Wesleyan University announces the appointment of Dr. Franklin Fearing, Associate Professor, and Willard Valentine, Instructor in Psychology. The department has new quarters in the remodeled gymnasium consisting in all of nineteen rooms.

Vanderbilt University announces the appointment of Dr. John M. Fletcher, Tulane University, to a Professorship of Psychology.

The University of Michigan reports that Prof. William Clark Trow has returned from his year of service as visiting Associate Professor of Psychology at Yale to his regular position at Michigan.

Miami University has now a Bureau of Special Education and Psychoeducational Clinic with six full-time staff members and two part-time assistants in the center at Dayton and three part-time assistants at Toledo. The Director, Prof. J. E. W. Wallin, is Consulting Psychologist in the Dayton schools and will soon have appear from the Houghton Mifflin Company, Riverside Press, a text book in Clinical and Abnormal Psychology, a companion volume to The Education of Handicapped Children, also by Dr. Wallin.

Pennsylvania State College reports the resignation of Dr. David Allen Anderson who has accepted the Presidency of the Kent State Normal, Kent, Ohio. Dr. Carroll D. Champlin, Southwestern State Normal School, Pa., has been appointed Professor of Education at Pennsylvania State College.

Vassar College announces the publication of "From Myth to Reason" by Dr. Woodbridge Riley. Dr. Riley acted as chairman of the section on Current Philosophy at the Sixth International Congress of Philosophy in Cambridge, Mass., held recently.

Northwestern University reports the return of Prof. R. H. Gault from two years leave with the National Research Council. He will give half of his time to his research work on tactual speech and half to teaching. Prof. Delton T. Howard has been appointed Personnel Director. Dr. Esther Gatewood has been made Assistant Professor and Dr. William H. Sheldon, formerly Assistant Dean in the School of Commerce and Administration, University of Chicago, has been made an Assistant Professor of Psychology.

The University of Rochester announces the death of Dr. Elliott Frost, Professor of Psychology and Education and Director of University Extension and the Summer Session. Dr. Hulsey Cason has been appointed Assistant Professor of Psychology.

"New Type Content Examination," Columbia Research Bureau Tests for High Schools and Colleges. The Bureau of Collegiate Research of Columbia University, Dr. Ben D. Wood, Director, has had published recently by the World Book Company six such tests: English, French, Spanish, German, Physics and Plane Geometry. Tests in other subjects are being prepared. Those interested will address World Book Company, Yonkers, N. Y.

Industrial Psychology announces a special double issue on "Industrial Adjustment through Vocational Guidance." This should be a valuable

reference work on the world-wide status of vocational guidance for the second half of this year. Dr. Douglas Fryer, editor of this special number, was abroad last summer in search of authoritative material.

Scholastic, a national magazine for the high school and class room, has announced four groups of major awards for creative work by secondary school children in literature, art and civics. No subjects are assigned. The Pittsburg Plate Glass Company is sponsor for these awards. Address "Scholastic" Wabash Building, Pittsburg, Pa.

Children, The Magazine for Parents, 353 Fourth Avenue, New York City, is offering a new pamphlet on "Group Study for Parents." Detailed information is given concerning the organization of such groups and a list of recommended books on child study is divided into seven classifications: (1) General, (2) Health and Feeding, (3) Sex and Adolescence, (4) Child Psychology, (5) Education, (6) The Family and the Race, and (7) Fiction Interpreting Child Life. This pamphlet may be had for ten cents and the books ordered from this magazine.

In the Psychological Laboratory of the Boston Psychopathic Hospital, Miss Edith F. Symmes, Psychologist, has resigned to take up work under a Fellowship at Yale. Her duties are temporarily taken over by Miss Clairette P. Armstrong, of the Children's Court Clinic, New York City. Miss Frances Botkin, with the Laboratory during the summer, has returned to her position at Smith College, her work being taken over by Miss Barbara Kendall. Mr. E. N. Brush, graduate student in the Harvard Psychological Laboratory, is interne in psychology at the Hospital for the coming year.

The Committee on Child Development, Division of Anthropology and Psychology of the National Research Council, desire that the attention of promising and interested candidates be called to the National Fellowships in Child Development, made possible by the Laura Spelman Rockefeller Memorial grant. The aim is to attract to this field of investigation qualified workers who will increase the scientific knowledge of the child along various lines and bring this knowledge to parents and others concerned with child life. Those interested should address Dr. R. L. Marston, Executive Secretary, Committee on Child Development, National Research Council, Washington, D. C.

Prof. Herbert A. Toops, Ohio State University, has reported that thirty-two colleges, member of the Ohio College Association, are engaged in a program of intelligence testing and research in which over 12,000 freshmen examinations have been given.

BOOK REVIEWS

LEONARD T. TROLAND. *The Mystery of Mind.* New York: D. Van Nostrand Company, 1926. 253 pages.

While this book is not written for the technician immersed in the application of modern psychological methods to the practical problems of human life, yet the best work in applied psychology is still so near to the fundamental problems of human behavior that the systematic and theoretical developments in the normal field are still necessary interests for the technician. Dr. Troland's book represents a departure from traditional conceptions particularly with respect to the able manner in which he has related the accumulating wealth of new material in physics, biochemistry, and biology to the profound changes that are occurring in our conceptions of the nature of human activity. This explains the originality which is found in the treatment of such topics as: What is mind? the nature of consciousness, what is matter? the interrelations of consciousness and matter, sensation as the foundation of mind, human happiness and personality, the fundamental relations of consciousness and electricity, and other headings.

Chapter XII on the physics of nerve action is one of the clearest expositions of the recent work on the nature of the nervous mechanism with which the reviewer is familiar. In the second paragraph of this chapter we are reminded of Troland's systematic status, "Let us remember" he says "that consciousness and the material world of physical science are two entirely different and separate things. Let us not forget, however, that these two systems are bound together by laws, so that the changes which occur in one seem to be determined by those which take place in the other" (p. 180). This is a dualistic position. The physical universe is governed, presumably, in conformity with the law of the conservation of energy, while " . . . . the sentient universe" (mind) "as a whole is governed by a hedonistic law" (p. 242).

The clarity of the subsequent exposition in Chapter XIII on the relations of consciousness and electricity is somewhat dimmed. After an altogether brilliant analysis of visual physiological functions we read, "Now the total nature of the process in the cortex which corresponds to the red sensation will involve the inherent nature of the 'red receiver' as well as the special rhythm which represents red in the nerve current. Hence we must suppose that there is a special material or electrical structure underlying red as well as a special activity or change. Thus the 'red excitation' in the cortex, regarded as a whole, is a com-

bination of structural and the dynamical (or change) features. *It is a certain structure undergoing a certain change*" (p. 212). One wonders how such an able physicist could forget the law of the conservation of energy long enough not to realize that the "red excitation" in the cortex cannot stop in the cortex. It must go somewhere. If, as Troland himself would probably agree, its only outlet is into some effect or pattern, the postulate of a separate non-physical entity (a red sensation) is superfluous. Why not assume that the effector pattern is the concrete physical condition to which we have given the abstract name "a red sensation"?

This introduces the controversial topic of physical *versus* psychical monism, which carries us beyond the limits of this review and of Troland's excellent book. But, that a permanently dualistic system is unacceptable to him is clear from his closing section which carries the title, Idealism. Yet throughout the book the dualistic assumption is so dominant that we must regard his monism as provisional. Does not the following quotation warrant our doing so? He says, "However, we cannot hope in the present book to make such a doctrine" (psychical monism) "really clear. To do so would be too difficult and if successful would unduly dispel the 'mystery of mind'; which it has been our purpose to set forth rather than to solve" (248).

ALBERT P. WEISS,
Ohio State University.

FLORENCE L. GOODENOUGH. *Measurement of Intelligence by Drawings.* Institute of Child Welfare, University of Minnesota. In Measurement and Adjustment Series, edited by Lewis M. Terman. Cloth. xiv + 177 pages. Illustrated. Price $1.80. Also *Goodenough Intelligence Test*, by the same author. Children's Drawing Sheet in package of 25, with Key and Class Record, 60 cents net per package. Yonkers-on-Hudson, New York: World Book Company.

To those who are a little tired of the sameness of content of many of the tests of intelligence recently developed, Dr. Goodenough's test will be a refreshing novelty. After several years of patient research, the author of *Measurement of Intelligence by Drawings* has published her test and a descriptive account of results from its use. The book summarizes work in a new field of mental measurement about which little of a quantitative nature has previously been known.

If ever in the consideration of scientific work an *a priori* judgment were dangerous, it would be in deciding upon the merits of Dr. Goodenough's contribution. The reader who glances through the book and decides upon its merits after a brief skimming (perhaps also the cursory study of scoring methods in some of the figures in Chapter VII) is liable to do a serious injustice to the author. Only after a careful study of the

entire book and a correct application and scoring of the test is any one able to judge the value of this work. For Dr. Goodenough's test is perhaps far less convincing at first view and upon superficial analysis than any test of intelligence now in use.

The test is non-verbal, easy to administer and takes but ten minutes to give. The practiced scorer can score a blank in about two minutes. Briefly summarized, the directions merely request the child to "make a picture of a man." The test is useful with children in the kindergarten and primary grades, or from mental age 4 to mental age 10. Its reliability for a single unselected age group in this range lies between 0.80 and 0.90. For separate age groups in the same range it yields an average correlation of 0.76 with the Stanford-Binet.

Part I of the book contains an historical survey of the problem of the relationship between intelligence and drawing, an account of the methods employed in building the Goodenough Test and discussions of results so far obtained by its use. An interesting chapter on the psychological interpretations of drawing opens up many possibilities for future research studies. Part II contains a description of the test procedure and detailed directions for scoring. A bibliography of almost 200 titles is given at the end.

The book is a very valuable and important contribution to the literature of intelligence measurement. If the test does in practice what it has done in its standardization, it will prove a useful part of the testing program in the kindergarten and primary grades.

NORMAN FENTON,
Ohio University.

SAMUEL D. SCHMALHAUSEN. *Humanizing Education.* The New Education Publishing Company, 1926. Pp. 343.

This is a series of essays, or tirades, on current educational practices the underlying theme of which seems to be "Whatever is, is wrong." It is written in the most improved ultramodern style. Incomplete sentences. Many exclamation points! No plot. It does point out some of the sore spots in our ways of educational thinking and doing and is, in rare instances, rather clever. Its general tone, however, will not probably attract many readers. An appended "Psycho-biography" tells the reader of the author's difficulties in securing a publisher and reveals to one with slight training in abnormal psychology, the real reason for the book.

H. I. SCHOU, M.D. *Religion and Morbid Mental States.* Translated from the Danish by W. Worster, The Practical Christianity Series. The Century Co., 1926, Pp. 217.

This series of lectures delivered to a group of clergymen at the University of Copenhagen is an attempt to acquaint spiritual doctors with

some of the symptoms, conditions and methods of treatment of those common mental diseases with which they are particularly apt to come in contact. Dr. Schou shows that many forms of mental disorder commonly display themselves in some sort or other of religious activity. This being true it is manifestly desirable that the clergy have some training in the recognition of these abnormal conditions in order that they may in some cases give real relief and in others realize the need of reference to medical aid. He admits the real value of religion in the care of certain disorders and advocates the Holland plan of having separate hospitals for those of differing religious attitudes—a Protestant hospital, a Catholic one and a "neutral" one.

The book treats particularly of: the relations of religion to melancholia, manic depressive insanity, certain incurable diseases—e.g., dementia praecox; religion as a propaedeutic and as a cause of insanity and religion in nervousness and mental degeneration. Although religion is sometimes recognized as a cause of insanity it is shown to much more frequently be of actual aid in the prevention of mental disorders. Brief discussion of each topic is followed by case studies. Non-technical language is used and the book throughout is simply written—too simply for use as a textbook in classes in abnormal psychology but admirably adapted for its intended audience, clergymen of little or no training in abnormal psychology or psychiatry.

H. Gordon Hullfish. *Aspects of Thorndike's Psychology in Their Relation to Educational Theory and Practice.* Ohio State University Studies, Contributions in Principles of Education No. 1. 1926. Pp. 113.

In this monograph Hullfish insists that a good structure of educational practice can be erected only upon a consistent theoretical basis of psychology. A brief analysis shows that psychologists are not agreed as to the nature of mind and, therefore, that educational practice is in chaos. An examination of several of Thorndike's doctrines reveals that they are not consistent with any one psychological theory and so he is particularly dangerous as an educational leader. As a matter of fact, consistency is not really that for which Hullfish is seeking for it is obvious from the tone of his references to other systems, e.g., behaviorism —which is "crass," that they will not do. Like a good controversalist, he presents a substitute plan, but as his psychological theory is supported by no whit of evidence other than the mere say-so of himself and Professor Dewey, it is difficult for the reviewer to see how he may expect it to bring about, as yet, sweet concord among the disagreeing psychologies of 1925.

Specifically, Hullfish objects: to Thorndike's doctrines, of readiness—it is mechanistic, of satisfiers and annoyers—they imply a dualism, of concept formation—common elements do not exist and anyway the

treatment is dualistic, of learning as analysis—not enough is made of synthesis, to his treatment of the stimulus as something physical, to his faith in the measurability of educational products and to his lack of emphasis on ultimate social aims.

Hullfish's method is literary and proof-text and as usual this method leads its author into difficulties. His whole section on analysis and synthesis in learning is based on the inference from "All learning is analytic" to "Learning is all analytic" and falls in the face of: "Of this analytic learning . . . . fuller account will be given later. The simpler connection-forming . . . . is obviously the primary fact and will be considered first" (Thorndike, *Educational Psychology*, Briefer Course, p. 141). There are numerous cases where similar counter proof-texts might be given—notably in relation to the matters of concept and habit formation—and whereas no other sort of evidence is presented, one side has as good a case as the other.

Hullfish does show that Thorndike's doctrine of satisfiers and annoyers implies a dualism. To overcome this dualism, Hullfish postulates "meanings." (Or "suggested objects," or "ideas," or "concepts," p. 96.) These meanings are "real" but they are "non-physical," on a "different level than the physical," "not quantitative," "not measurable." They can be "detached from physical objects" and "attached to symbols." (These symbols are "carriers of meanings.") They "compete with each other" and moreover act as stimuli and produce reactions. (See chapters VI and VII.) And the very existence of these meanings as a firm foundation for our educational edifice is to be taken on faith. However, this lack of evidence will probably disturb only those who are "Hypnotized by the fetish of science."

Hullfish is particularly opposed to the doctrine of the measurability of educational products and holds that the really valid aims are the enrichment of social concepts. Since these concepts are immeasurable it would seem to follow that the student and teacher alike are faced with the dreary prospect of years of endeavor in view of a goal but without the slightest means of knowing of any progress towards it is being made. It is quite possible that Thorndike will be content to "drill" along, happy in the thought that at least he can tell if he is getting anywhere.

D. A. WORCESTER,
Ohio University.

WALTER SCOTT MCNUTT. *A Handbook for Socializing Education through Community Welfare Clubs.* Boston: The Palmer Company, 1926. 54 pp. $1.00.

Despite its ambitious title, this slender paper-covered volume without table of contents, index, or bibliography, and with but a partial treatment of the field indicated, should be classified as a pamphlet rather than as a handbook in the traditional sense of the term.

The author makes an ardent plea for "social education" as against "individual education" and goes so far as to say that "we must socialize education to save the state." This very general objective, he believes, can best be realized through the socializing influence of what he calls "community welfare clubs." Under this category he describes briefly a few of the well-known features of such Organizations as Boy Scouts, World Scouts, Girl Scouts, Big Brothers and Big Sisters, and the boys' and girls' clubs sponsored by state departments of agriculture. He also mentions clubs for farmers and their wives. By means of practical suggestions, model constitutions, and programs the author demonstrates how such organizations may be started and successfully operated. He is convinced that the school building, as the natural center of interest for the entire community, will in time become the "social center" where such club activities will be carried on.

The volume, though limited in scope and in keenness of sociological penetration, offers practical suggestions to leaders of boys' and girls' clubs. Educators might be interested in the author's theory of social education, although, struggling as they do with the problem of finding specific materials and specific methods for the attainment of specific objectives for specific type groups and individuals, they will probably not share the author's enthusiasm for a social education so vaguely defined and yet so confidently considered as the magic solution for all the knotty problems of our present social order.

ARTHUR H. ESTABROOK AND IVAN E. MCDOUGLE. *Mongrel Virginians: The Win Tribe.* Baltimore: The Williams & Wilkins Company, 1926. 205 pp. $3.00.

This book is the outcome of an extended and painstaking investigation into the genetic relationships and the resulting physical, mental, and social characteristics of a mongrel Indian-White-Negro group occupying an isolated strip of land four miles wide and eight miles long in the foothills of the Blue Ridge Mountains of Virginia. Assisted by a group of students trained in sociology the two investigators, one a eugenist of the Carnegie Institution of Washington, the other a professor of sociology of Goucher College, examined state and county records and interviewed officials, mission workers, teachers and long-time residents of the district bordering on the territory of the "Win tribe," as the group is called by the investigators. The Wins themselves were interrogated frequently and were observed over a period of two years. The intricate genetic and social patterns of the century-old group could thus be reconstructed in the form of diagrams, statistical tables, and descriptive paragraphs packed with information. As a whole this represents the most complete scientific study of triple race mixture in a small area that has come to the attention of the reviewer.

The Win group, it appears, originated in 1790, when two Indian strains, perhaps only partly pure, mingled in marriage with a white strain. Another Indian strain was added in the second generation, and Negro blood entered somewhat later. Effective isolation due to the stigma of color prevented scattering of the Wins and forced them to intermarry within their own blood group, yet did not check the infiltration of inferior white and colored blood from the outside, partly through legal marriage and partly through illegitimate sex relations. The authors assume the Indian, Negro, mixed, and late white stock, with the exception of one case, to have been distinctly inferior to the original white stock, which they rate as "at least of normal ability." The present population of six hundred and fifty-eight persons, reproducing at an average fecundity rate for all generations of 4.71 per child-bearing female, inbreeding at a rate of approximately 50 per cent, having a general average illegitimacy rate of over 20 per cent, exhibiting feeblemindedness in practically every person in varying degrees, and living on a very low economic, social, and cultural plane, presents a picture of startling human and social deficiency. An unusually low record of alcoholism, venereal disease, and crime appear as the only bright spots on the otherwise extremely gloomy canvas.

Does race mixture of the type described invariably lead to a lowering of mental capacities in the offspring? The authors carefully refrain from formulating a positive answer to this question. They insist that the materials are presented as a "careful summary of the facts of history" and not as a theory on race mixture. Yet, they include in their study a dozen outline sketches of triple race mixture in other parts of the South, many picturing an inferior type of progeny; they append a copy of the Virginia Racial Integrity Law of 1924; they express the belief that if this law can be enforced, it will preserve racial integrity; and their publishers announce on the jacket of the volume that the findings will have "vital and important bearings on racial integrity and the maintenance of the 'color line' in the South." Thus the findings are unfortunately given greater universality than was obviously intended by the authors. It is to be hoped that the investigators will soon find it possible to complete the projected studies mentioned in the volume so that comparable data be obtained for generalizations of wider social significance. In the light of recent studies in the fields of psychiatry and social work it might seem desirable to measure the influence of the social environment upon the mental reactions and the organization of personality in the Win area in order to detect any spurious innate deficiencies.

As the study stands, it impresses the reviewer as a piece of careful research yielding valuable data to the future investigator in the field of

race mixture. The authors also deserve the gratitude of the State of Virginia for uncovering errors in the census classification of colored persons which would have worked injustice to those marrying under the Racial Integrity Law, and for calling attention to a problem of serious social inadequacy.

H. J. JEDDELOH,
Ohio University.

TRUMAN L. KELLEY. *Influence of Nurture upon Native Difference.* New York: The Macmillan Company, 1926.

It has been recognized for many years that the different varieties of the human race exhibited different characteristics of temperament, intelligence, habits, and physical vitality and acquirements. It has also been admitted that history, political, religious, commercial, and racial, has been determined to a greater or less extent by the diversity of these characteristics. In spite of this somewhat general cognizance of those important factors in the history and welfare of nations and races, little organized, scientific study of them was ever made until the last few years of this present century. And even at the present time the few facts available are chiefly physical and, to a much less extent, mental measurements and comparisons of two or more races.

The vastly important characteristic of temperament, what we might call the innate tendencies, of a race has been almost wholly disregarded due partly to failure to realize its importance but chiefly to the apparently hopeless complexity of the problem.

The work reported which forms the basis of the news expounded in this extremely interesting book was performed by the authors in what is probably the most desirable place in the world from an experimental point of view, Hawaii. The mixture of races combines every known race except the American Indian and several varieties of some of them.

Part I of the book is introductory, giving the reasons for the investigations, the importance of temperament in the race, and the methods to be used.

Part II gives a very interesting and valuable history of the different races present in Hawaii. This part alone would justify anyone in spending the time to read it carefully, leading as it does to the heart of the problem of over-population in certain countries, with its attendant dangers of economic and racial imperialism. This part is extremely informative to anyone interested in the origin of such a diversity of peoples as occur in this small group of islands.

Part III is a social analysis of the different races and gives the results of the individual temperament of the race. The different races are rated according to the strength or weakness of certain social traits. Some of the social traits listed are lack of planning ability, impulsive-

ness, irresolution, etc., and their opposites. From these it can be seen that the method while rather unique and recent in scientific investigation, goes to the very center of the cause of racial difference and superiority or inferiority.

A racial efficiency index is worked out from the scores in the different social traits. It will be of interest to any reader to see the results of this ranking to find that the Japanese and Chinese are at the top.

Thus in the light of scientific studies, incomplete and inconclusive though they may be, we are beginning to see that there are few bases for our exalted opinion of the white races. Again in social adjustment as measured by lack of criminality, business initiative, success in professions and trades, etc., we find many surprises.

Part IV deals with the brain development of the different races and gives some very illuminating facts and conclusions concerning the cranial capacity at different ages for both sexes of Anglo-Saxon, Japanese and Chinese children. The Japanese are shown to have a cranial capacity greater than the Chinese, and equal to whites of the same social standing. The history of the races in Hawaii is of importance here in classifying the children into the proper social groups.

Part V gives facts relative to the mentality of the different races. Binet tests and Army tests were made. In these tests the Chinese compared very favorably with Northern Europeans and Americans, and excel considerably Southern Europeans. The authors very carefully point out however that these tests are only a measure of school intelligence and not of racial intelligence. In order to measure racial intelligence the tests for social traits and adaptability must be included.

Parts VI and VII are given to a discussion of the importance of exact knowledge concerning the relation of temperament to race and to racial futures. Strength of racial character is needed to safeguard a nation or a race rather than military fortifications. The Japanese are shown to be superior to all other groups in planning capacity, resolution and self-control. New ideas of behavior consistent with character must be adopted to conserve whatever superiorities of race we may possess.

EMMETT ROWLES,
Ohio University.

HENRY J. DOERMAN. *The Orientation of College Freshmen.* The Williams & Wilkins Company, 1926. 162 pp. $3.00.

Perhaps no single feature will give a better idea of the scope of this work than the three main divisions into which the outline falls, viz.:

Part I. Statement of the problem.

Part II. Current Practices with Respect to the Problems of Orientation in Representative American Colleges.

Part III. A Guidance Program.

In the first part the problems of the freshman and of the administration are analysed and the need for guidance of entering students is pointed out. Both the administration and the freshman should have a clear conception of the aims of the college in terms of which adjustment of the student to his college career should take place.

Part II embodies a thorough description of the more important methods of selecting students for admission to college, advisory systems and orientation courses.

The third part of the book is in many ways the most valuable. After showing that student guidance in the colleges is inadequate and ineffective, the author suggests a personnel service or guidance department of which he says:

"Its effectiveness is bound up with the utter avoidance of impersonal methods and machinery. . . . . It must be the business of some one in the college to see that the student is adequately known and understood. This does not mean that teachers and other officers have less responsibility for becoming better acquainted with their students, nor does it mean that they should discontinue giving advice when it is sought, but it does mean that there must be some agency in the college where as nearly a complete picture as it is possible to obtain is available for the purpose of guidance."

The relation of the personnel service to the dean's office is discussed. Various phases of guidance before, during and after registration are outlined. An extensive bibliography adds to the value of the book. Anyone engaged in administrative or advisory work can scarcely fail to find this contribution helpful. It is to be hoped that it will find its way into the hands of many college presidents and deans who are not yet awake to the need of the student for assistance in adjusting himself to college life.

Amos C. Anderson,
Ohio University.

NEW BOOKS AND PAMPHLETS RECEIVED*

Books and pamphlets for reviews should be sent to James P. Porter, Department of Psychology, Ohio University, Athens, Ohio.

Ability, A Psychological Study. VICTORIA HAZLITT. Macmillan Company, New York. 147 pp.

Adaptation of Subject-Matter and Instruction to Individual Differences in Elementary Schools. PEDRO T. ORATA. Educational Research Circular No. 40. University of Illinois, Urbana, Ill. 19 pp.

Conservation of the Family. PAUL POPENOE. Williams & Wilkins Company, Baltimore, Md. $3.00. 266 pp.

Effect of Time upon Variability, The. ELLA WOODYARD. Bureau of Publications. Columbia University, New York.

Genetic Studies of Genius, Vol. II. CATHARINE M. COX. Stanford University Press, Stanford University, Calif. $5.00. 842 pp.

Individual Differences in Intelligence of School Children. MARY M. WENTWORTH. Harvard Studies in Education No. 7. Harvard University Press, Cambridge, Mass. 158 pp.

Influence of the Summer Vacation on the Abilities of Fifth and Sixth Grade Children. MARGARET E. NOONAN. Bureau of Publications, Columbia University, New York.

Introduction to Social Psychology, An. L. L. BERNARD. Henry Holt & Company, New York. 651 pp.

The Language and Thought of the Child. JEAN PIAGET. Harcourt, Brace & Company, New York. $3.75. 246 pp.

Learning How to Study and Work Effectively. WILLIAM F. BOOK. Ginn & Company. 475 pp.

Mental Abnormality and Deficiency. SIDNEY L. AND LUELLA COLE PRESSEY. Macmillan Company, New York. 356 pp.

A New Method of Mental Testing. J. J. STRASHEIM. Warwick & York, Baltimore. 158 pp.

The Orientation of College Freshmen. HENRY J. DOERMANN. Williams & Wilkins, Baltimore. $3.00. 162 pp.

Psychological Studies. THEODOR LIPPS. Williams & Wilkins, Baltimore. $6.00. 333 pp.

Psychology for Teachers. BENSON, LOUGH, SKINNER AND WEST. Ginn & Company, Columbus, Ohio. $2.00. 390 pp.

---

* Mention here does not preclude further comment.

Report on Age and Progress of Pupils in the Boston Public Schools. School Document No. 12, 1925. Boston Public Schools. 136 pp.

Psychology of Thought The. H. L. HOLLINGWORTH. D. Appleton Company.

The Social-Ethical Significance of Vocabulary. GLADYS C. SCHWESINGER. Bureau of Publications, Columbia University, New York.

Some Difficulties in Elementary School History. ADELAIDE M. AYER. Bureau of Publications, Columbia University, New York.

INDEX OF AUTHORS

The names of authors of original contributions are printed in CAPITALS AND SMALL CAPITALS.

Anderson, Amos C., 403.
ARTHUR, GRACE, 228, 400.
BURCHARD, THOMAS C., 162.
BURKE, RUTH S., 315.
CLEETON, GLEN U., 327.
DORCUS, ROY M., 502.
DOWNEY, JUNE E., 519.
EARLE, MARY GOODYEAR, 453.
EASTMAN, EVELYN, 202.
EDGERTON, HAROLD, 378.
EIGENMANN, THORA, 63.
Fenton, Norman, 528.
FISHER, T. R., 411.
Franken, Richard B., 292.
Gard, Willis L., 136, 139, 404.
GARRETT, H. E., 411.
GARTH, THOMAS R., 437.
GAULT, ROBERT H., 75.
GILLILAND, A. R., 143, 315.
GLEASON, CLYDE W., 171.
Goddard, H. H., 294.
HEIDBREDER, EDNA, 52.
Hollingworth, H. L., 132.
HULL, HAZEL LUCILLE, 180.
HURLOCK, ELIZABETH B., 67.
Jeddeloh, H. J., 535.
JONES, EDWARD S., 427.
JONES, HAROLD ELLIS, 367.
KITSON, HARRY DEXTER, 341.
LANGLIE, T. A., 303.
LEHMAN, HARVEY C., 462.
LEWIS, GORDON, 63.
LOVELESS, J. E., 346.
MCNUTT, WALTER SCOTT, 117.
MERRILL, MAUD A., 470.
Miner, J. B., 405.
MORGAN, JOHN J. B., 180.
Morton, R. L., 405, 408.
NEWHALL, S. M., 151.
PATERSON, DONALD G., 378.
PEYTON, EDITH M., 264.
PORTER, JAMES P., 264.
POWERS, NELLIE E., 188.
Pratt, C. C., 295.
Renshaw, Samuel, 297, 402.
Roush, Stanley F., 298.
Rowles, Emmett, 534.
RUCH, G. M., 421.
SCHWESINGER, GLADYS C., 245.
Smith, Edwin B., 296.
SNODDY, GEORGE S., 1.
SNOW, A. J., 37.
STODDARD, GEORGE D., 421.
STRONG, EDWARD K., 107, 134, 290, 346.
TOOPS, HERBERT A., 92.
UHRBROCK, RICHARD S., 487.
WANG, S. L., 102.
WARDEN, CARL J., 63, 162.
WEBER, C. O., 89.
WEINLAND, JAMES D., 277.
Weiss, Albert P., 527.
WITTY, PAUL A., 462.
Worcester, D. A., 530.
WORTHINGTON, MYRTLE RAYMAKER, 216.
YAHN, EARL, 63.
Yoakum, C. S., 137.

INDEX OF SUBJECTS

Titles of books are followed by the name of the author of the work reviewed. All other references are to original articles.

Ability, interest as indication of, 487; ——, phenomenal memorizing as special, 367; —— with below average intelligence, special, 519.

Advertisements, "Want" and "Solution," 346.

Advertising, Saturday Evening Post, certain aspects of, 63; —— section upon value of individual advertisements, effect of size of, 162; ——, value of white space, 107.

Aggressiveness Tests, Moore-Gilliland, 143.

Applications, learning and stability, psychophysiological analysis, clinical, 1.

Aptitude, testing engine lathe, 171.

Aspects of Thorndike's Psychology in their relation to educational theory and practice (Hullfish), 529.

Attention Value of Newspaper Advertisements, The (Franken), 289.

Automobile license numbers, perceptibility of, 277.

Character, slang as an indication of, 245; —— traits and intelligence, relation between personality and, 453.

Characteristics, factors involved in judging personal, 502.

Child, index of social participation, in negro, 462.

Children, psychological clinic, mental differences in, 470; —— suitability of Downey Group Will-Temperament test, as a test for, 67.

Clinic, mental differences in children, psychological, 470.

Clinical applications, psychophysiological analysis, motor learning and stability, 1.

College students, opinions of, 427.

Common Sense and Its Cultivation (Hankin), 296.

Differences in children, psychological clinic, mental, 470;—— in handwriting, sex, 151.

Difficulty of group test items, optimum, 327.

Deficients (girls) for special class center, classification of mental, 188.

Delinquents, information test applied to juvenile, 202; ——, moral judgment in female, 89.

Democrats among eminent Americans, frequency of Republican and, 341.

Determinism in Education (Bagley), 405.

Downey Group Will-Temperament Test, test for children, suitability of, 67; —— will-temperament traits, ratings, 421.

Eminent Americans, frequency of Republicans and Democrats among, 341.
Employer-Employe Relations in Hotels (Hamilton), 404.
Engine lathe aptitude, testing, 171.

Fatigue of Indians, nomadic and sedentary, mental, 437.
Female delinquents, moral judgment in, 89.
Follow-up letters to questionnaires, returns from, 92.

Girls, classification of mental deficients, for special class center, 188.
Group test items, optimum difficulty, 327; —— will-temperament test, a test for children, suitability of Downey, 67.

Handbook for Socializing Education through Community Welfare Clubs (McNutt), 530.
Handwriting, sex differences in, 151.
Height-weight ratio, intelligence and, 52.
Helmholtz's Treatise on Physiological Optics (Southall), 294.
How Much English Grammar? (Stormzand and O'Shea), 403.
How to Make a Course of Study in Arithmetic (Herriott), 405.
Humanizing Education (Schmalhausen), 528.

Indians, nomadic and sedentary tribes, mental fatigue of, 437.
Influence of Nurture upon Native Difference (Kelley), 533.
Intelligence, group point scale, measurement of, 228; ——, the relation between personality and character traits, and, 453; ——, special ability with below average, 519; —— tests, language difficulty involved in comparing racial groups, 102.
Introduction to Objective Psychopathology, An, (Hamilton), 292.
Introduction to Retail Advertising (Brewster), 402.
Iowa placement tests, analysis of, 303.

Judging personal characteristics, factors involved, 502.
Judgment in female delinquents, moral, 89.
Judgments based on sensation intensities and time allowed for making, 117.
Juvenile delinquents, information test, 202.

Language difficulty involved in comparing racial groups by means of verbal intelligence tests, demonstration of, 102.
Lathe aptitude, testing engine, 171.
Learning to Typewrite with a Discussion of the Psychology of Skill (Book), 137.

Measurement of Intelligence by Drawings (Goodenough), 527.
Measurement of intelligence, group point scale, 228.
Memorizing as a "special ability," 367.
Mental deficients (girls) for special class center, 188.

Methods of teaching primary reading, old and new, 264.
Misconceptions, prevalence of popular, 411.
Mongrel Virginians: The Win Tribe (Estabrook and McDougle), 531.
Moore-Gilliland aggressiveness test, revision and results, 143.
Motor learning, clinical applications, psychophysiological analysis, 1.
Mystery of Mind, The (Troland), 526.

Need for Eugenic Reform, The (Darwin), 297.
New methods of teaching primary reading, old and, 264.
Numbers, perceptibility of automobile license, 277.

Orientation of College Freshmen, The (Doerman), 534.

Percentages for varying numbers of cases, standard errors and probable errors, 378.
Performance tests, study of commonly used, 216.
Persistence, measurement of, 180.
Personal characteristics, factors involved in judging, 502.
Personal Leadership in Industry (Craig and Charters), 136.
Personality and character traits and intelligence, relation, 453.
Pilots, tests for transportation, 37.
Placement tests, analysis of Iowa, 303.
Point scale for the measurement of intelligence, group, 228.
Political Action: A Naturalistic Interpretation of the Labor Movement in Relation to the State (Eldridge), 295.
Primary reading, old and new methods of teaching, 264.
Probable errors of percentages for varying numbers of cases, table of standard errors and, 378.
Psychological clinic, mental differences in children, 470.
Psychology in Advertising (Poffenberger), 132.
Psychology of Gestalt, The (Helson), 400.
Psychology of Selecting Men, The (Laird), 132.
Psychology of Selling and Advertising (Strong), 290.
Psychology of Skill (Book), 134.
Psychophysiological analysis, motor learning with clinical applications, learning and stability, 1.

Questionnaires, returns from follow-up letters, 92.

Racial groups by means of verbal intelligence tests, language difficulty involved in comparing, 102.
Ratio, intelligence and height-weight, 52.
Reading, old and new methods of teaching primary, 264.
Religion and Morbid Mental States (Schou), 528.
Republicans and Democrats among eminent Americans, frequency, 341.

Scale for measurement of intelligence, group point, 228.
Sensation intensities and time allowed for making judgments, correctness of judgments, 117.

Size of advertising section, value of individual advertisements, effect of, 162.
Sociability, measurement of, 315.
Social participation, negro child's index of, 462.
"Solution" advertisement, "want" and, 346.
Special ability with below average intelligence, case of, 519; —— ability, phenomenal memorizing as, 367; —— class center, classification of mental deficients (girls) for, 188.
Spoken words by their tactual qualities, identification of, 75.
Stability, learning and, 1.
Standard errors and probable errors of percentages for varying numbers of cases, table of, 378.
Students, opinions of college, 427.
Summary of Investigation Relating to Reading (Gray), 403.

Tactual qualities, identification of certain spoken words, 75.
Temperament traits, ratings of Downey will-, 421.
Testing engine lathe aptitude, experiment in, 171.
Test for children, suitability of the Downey Group Will-Temperament Test, a, 67; —— items, optimum difficulty of group, 327; ——, Moore-Gilliland Aggressiveness, 143; —— of juvenile delinquents, information, 202.
Tests, analysis of Iowa Placement, 303; ——, commonly used performance, 216; ——, language difficulty involved in comparing racial groups, verbal intelligence, 102.
Time allowed for making judgments, correctness of judgments based on sensation intensities and, 117.
Traits and intelligence, relation between personality and character, 453; ——, ratings of Downey Will-Temperament, 421.
Transportation pilots, tests for, 37
Tribes, mental fatigue of Indians, nomadic and sedentary, 437.

Universal Scale of Individual Performance Tests, A, (Squires), 399.

Value of individual advertisements, effect of size of advertising section upon, 162.
Verbal intelligence tests, language difficulty involved in comparing racial group, 102.

White space in advertising, value of, 107.
Will-Temperament Test, a test for children, suitability of Downey Group, 67; —— traits, ratings of Downey, 421.

Directory of American Psychological Periodicals

American Journal of Psychology—Ithaca, N. Y.; Morrill Hall.
Subscription $6.50. 600 pages annually. Edited by M. F. Washburn, K. M. Dallenbach, M. Bentley, E. G. Boring. Quarterly. General and experimental psychology. Founded 1887.

The Pedagogical Seminary and Journal of Genetic Psychology—Worcester, Mass.: Clark University. Subscription $7. 700 pages annually. Edited by Carl Murchison and an international co-operating board. Quarterly. Child behavior, differential and genetic psychology. Founded 1891.

Psychological Review—Princeton, N. J.: Psychological Review Company.
Subscription $4.25. 480 pages annually.
Bi-monthly. General. Founded 1894. Edited by John B. Watson.

Psychological Bulletin—Princeton, N. J.: Psychological Review Company.
Subscription $5. 720 pages annually. Psychological literature.
Monthly. Founded 1904. Edited by Samuel W. Fernberger.

Psychological Monographs—Princeton, N. J.: Psychological Review Company.
Subscription $5.50 per vol. 500 pp. Founded 1895. Ed. by Shepherd I. Franz.
Published without fixed dates, each issue one or more researches.

Psychological Index—Princeton, N. J.: Psychological Review Company.
Subscription $1.50. 200 pp. Founded 1895. Edited by Walter S. Hunter.
An annual bibliography of psychological literature.

Journal of Philosophy—New York; 515 W. 116th St.
Subscription $4. 728 pages per volume. Founded 1904.
Bi-weekly. Edited by F. J. E. Woodbridge and Wendell T. Bush.

Archives of Psychology—Sub-Station 84, N. Y.: Archives of Psychology.
Subscription $5. 500 pp. ann. Founded 1906. Ed. by R. S. Woodworth.
Published without fixed dates, each number a single experimental study.

Journal of Abnormal Psychology and Social Psychology—Albany, N. Y.
Subscription $5. Boyd Printing and Publishing Co. Edited by Morton Prince in co-operation with Floyd H. Allport.
Quarterly. 432 pages annually. Founded 1906. Abnormal and Social.

Psychological Clinic—Philadelphia: Psychological Clinic Press.
Subscription $2.50. 288 pages. Ed. by Lightner Witmer. Founded 1907.
Without fixed dates (9 numbers). Orthogenics, psychology, hygiene.

Training School Bulletin—Vineland, N. J.: The Training School.
Subscription $1. 160 pp. ann. Ed. by E. R. Johnstone. Founded 1904.
Monthly (10 numbers). Psychology and training of defectives.

Comparative Psychology Monographs—Baltimore: Williams & Wilkins Co.
Subscription $5. 500 pages per volume. Edited by W. S. Hunter.
Published without fixed dates, each number a single research.

Psychoanalytic Review—Washington, D. C.: 3617 10th St., N. W.
Subscription $6. 500 pages annually. Psychoanalysis.
Quarterly. Founded 1913. Ed. by W. A. White and S. E. Jelliffe.

Journal of Experimental Psychology—Princeton, N. J.
Psychological Review Company. 480 pages annually. Experimental.
Subscription $4.25. Founded 1916. Bi-monthly. Ed. by Madison Bentley.

Journal of Applied Psychology—Baltimore: Williams & Wilkins Co.
Subscription $5. 400 pages annually. Founded 1917.
Quarterly. Edited by James P. Porter and William F. Book.

Journal of Comparative Psychology—Baltimore: Williams & Wilkins Co.
Subscription $5. 500 pages annually. Founded 1921.
Bi-monthly. Edited by Knight Dunlap and Robert M. Yerkes.

Journal of Personnel Research—Baltimore: Williams & Wilkins Co.
Subscription $5.00. 500 pages approximately. Edited by Walter V. Bingham, Lewis L. Thurstone, and Clarence S. Yoakum. Monthly.

Genetic Psychology Monographs—Worcester, Mass.: Clark University.
Subscription $7. 600 pages annually. Edited by Carl Murchison and an international cooperating board.
Bi-monthly from January, 1926. Each number one complete research.
Child behavior, differential and genetic psychology. Founded 1925.